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The Use of the Camera in Industrial Plants

From a Toy for Amateurs It Has Become a Valuable Adjunct to the Manufacturer—Interesting Details of the Practice Followed in a Number of Establishments

In these days of profusely and often splendidly illustrated catalogues, circulars and booklets and other literature in which halftones are abundant, to say nothing of periodical advertisements, in all of which expense is seldom

The growth of taking pictures as a concomitant of manufacturing or construction has for some time engaged the attention of makers of cameras and photographic apparatus and they are now endeavoring to arrange in



Progress Photographs Showing the Various Stages of Construction of the

New Open-Hearth Steel Plant of the Youngstown Sheet & Tube Company

spared to get the best pictorial results, everyone knows perforce that photography plays an important part in industry, but the real extent to which the art has been applied in manufacturing and selling is not so well known, or at least not fully realized. Therefore it is the purpose of this article to present some of the many uses of the camera in the mill, the workshop and afield. These uses are multiplying almost daily as one ingenious mind after another finds in photography another way in which time and effort may be economized or made more effective, as, for instance, by using the art to supplement the services of the drafting room and helping to dispense with lengthy and sometimes involved written descriptions.

which have been shown to exist. Of course, in the larger number of cases equipment which long has been on the market is ample to meet the requirements of ordinary work. In fact, it is asserted that a simple long focus view camera will do from 75 to 80 per cent. of the work ordinarily met with. For many kinds of detail work special apparatus is advisable, if not necessary, as it will render the required service more conveniently and accurately. Where special equipments are required the best procedure is to consult the manufacturers of high-grade cameras who will be glad to give the advice sought.

photographers and obtain the desired results by giving him explicit orders as to what is wanted. In fact, much of their work is so complex that a professional could not be dispensed with. Camera experts give one caution in particular in the matter of engaging a shop photographer which is that the portrait or studio photographer is seldom, if ever, the man to be employed for factory or mill work, and it is said that there have been some grievous results because of this mistake. There are radical differences between taking a machine or shop interior where scores of difficult or unexpected conditions may be encountered and making a portrait under the favorable circumstances of the well ordered studio.

The Niles-Bement-Pond Company has been making extensive use of the camera for many years under the supervision of its publicity department and has skilled commercial photographers who make exposures under direction of the managers of the various works and under the general supervision of the New York office, at the Niles works at Hamilton, Ohio, the Bement works at Philadelphia and the Pratt & Whitney works at Hartford, Conn. Should a photograph be wanted of a machine, or any group of machines or any subject for that matter, explicit directions as to the position of the subject and like details are sent to the photographer concerned for his guidance and almost without exception the results bring out to a nicety the points desired, showing as many details as possible, while not sacrificing the important appearance of weight.

This firm makes practically every application of photog-

and sometimes an absolute advantage to have a facsimile of the signature on the agreement appear on the reproduction.

The copying of blueprints is done at the New York office of the company on the thirteenth floor of No. 111 Broadway. Where one would least expect to find it there is a well-equipped room, light tight, but ventilated by electric exhaust fans, containing a high-class machine for reproducing drawings or contracts, and adjoining this is a darkroom replete with all necessary accessories for developing and printing. The photographing machine is a special one and is more than a mere camera as it is so designed that a darkroom is not essential, the machine itself containing a developing device. The exposures are made directly upon bromide paper instead of on plates or films and the exposed paper after being cut from the roll of which it is a part can be developed and fixed at once, in or out of the machine.

In the event of a darkroom being used, the exposed paper, after detachment, is enclosed in a dark box before being taken from the machine. Once in the dark box it can be safely laid aside or carried directly to the darkroom. This method of copying writings, drawings or printed matter makes it possible to have a number of exact duplicate copies in a very few minutes. The machine is not operated by an expert photographer as the apparatus is so nearly automatic that any office boy with a little instruction can get good results. Adjustment of focus is a slight mechanical operation and the period of exposure, selection of size of the reproduction wanted and use of



General View of the Section of the Westinghouse Electric & Mfg. Company's Works in Which Electric Locomotives Are Built. Taken by a Company Photographer. Similar Prints Are Made to Give an Intending Purchaser an Idea of the Magnitude of the Works

raphy which has been shown to be advantageous. Its photographers make the prints for its vast amount of advertising literature and a multitude of other purposes, and bromide enlargements suitable for framing. Sometimes one of its experts is sent out on the road to obtain illustrations for its Progress Reporter. It also photographs tracings, blueprints, contracts, or any other documents of which it is desired to obtain copies quickly and accurately. In making a copy of a contract it is always of interest

color screens to neutralize colors which might not otherwise have true values in the finished picture, requires but little judgment, so nicely have the operation and powers of the machine been calculated.

In passing it may be said that the United States Government has adopted the same design of machine for use in several of the departments at Washington and substantial savings have been effected over the older methods of copying which was attested a few months ago by the

Commission on Economy and Efficiency. Though the machine can be operated by daylight, the best results in steady work are obtained by artificial light and the Cooper Hewitt vapor light is used by many, including the Niles-Bement-Pond Company. Blueprints are practically all in the way of machine designs, which are copied in the office of the company at 111 Broadway, most of the tracings remaining at the various works.

Experiment has shown that with a sufficiently powerful light it is possible to make a blueprint from a blueprint, but the best of these results is so faint as to be unsatisfactory, and cannot be compared to the results of the camera. The result of photographing a blueprint directly on bromide paper is to bring out the lines of the design in black while the background is a soft gray. On the other hand, if a drawing or tracing is photographed the resultant background is black and the design is white. If the black is objectionable, rephotographing reverses the black and white. Original pencil sketches or drawings may be copied with facility, thus saving the tracing work.

A recent achievement of the photographers at the New York offices of the Niles-Bement-Pond Company was to copy a blueprint measuring 4 x 10 ft., the work being effected by photographing the print in sections which were then pasted together. One of the valuable features of the process is that blueprints or other drawings may be reduced to small size, as for instance that of a letterhead, and so easily transmitted through the mails in ordinary correspondence. The subject may also be enlarged within the capacity of the machine.

Also representative of what is being done photographically by the very large manufacturing corporations is the work of the Westinghouse Electric & Mfg. Company, which for a number of years has maintained as an adjunct to its department of publicity a photographic division, the records of which show an ever-increasing number of orders for photographs from year to year. To carry on the work, most of which is of too advanced a character for even the clever amateur to attempt, there is required an extensive equipment of cameras and lenses, as well as the special apparatus that is needed to photograph detail parts of apparatus

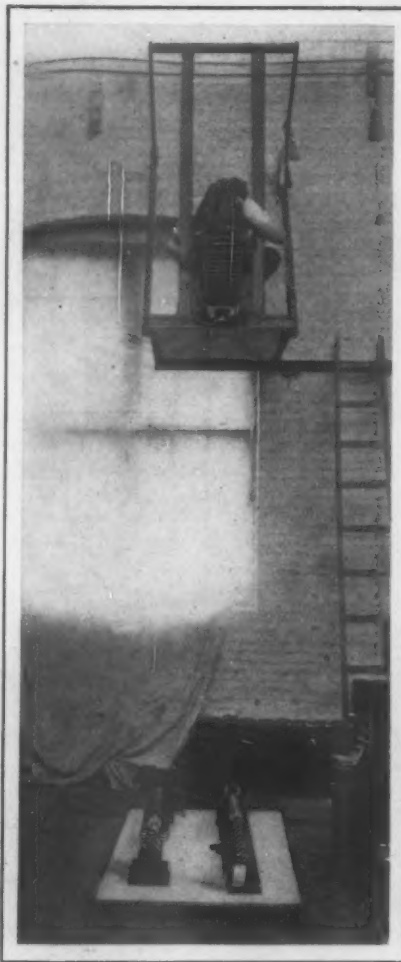
eral exterior views and making photographs at night to show how streets, parks and other places are illuminated by the various incandescent and arc lamps made by the company. Frequently, as with other companies, photographers are sent afield to obtain photographs for advertising and other purposes.

The standard sizes of plates used by the Westinghouse photographers are $6\frac{1}{2} \times 8\frac{1}{2}$ in. and 8×10 in. The photographer making the negative is required to number it properly and place it in an envelope having the same number, after which it is turned over to the man who handles the prints. As each new negative is received in the print room, prints are made for the permanent file, which is indexed according to class of apparatus. Large numbers of prints are made up for use with proposals, in order that the intending purchaser may be more clearly advised as to the appearance of the Westinghouse apparatus, and it is conceded that a better idea of the apparatus can be given by means of a photograph than with a drawing. After the necessary prints have been made and the negative properly recorded it is filed and is thereafter available for future orders.

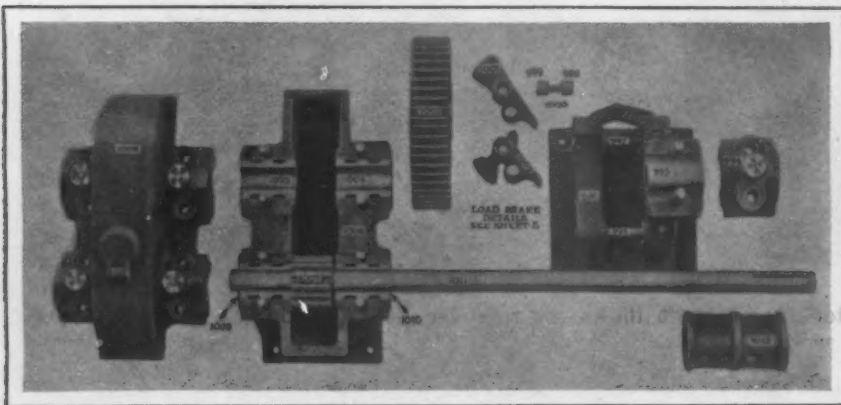
The Westinghouse Company also has a machine for copying drawings, blueprints, etc., which, like that already referred to, dispenses with glass or film negatives and makes good clear reproductions irrespective of the color of paper stock or color of ink. The machine is used quite extensively for photographing large drawings down to standard letterhead size, $8\frac{1}{2} \times 11$ in., which insures a uniform size in all the papers sent out with an estimate.

From the standard sizes of negatives the company's photographers make bromide enlargements up to approximately 24×30 in. in size, although larger ones are sometimes made on request. They are used for advertising purposes and are furnished to engineering firms, central stations, schools and colleges, etc. Lantern slides are also produced and are used extensively in connection with advertising through the agency of moving picture shows throughout the country, as well as being furnished in sets to schools and colleges for use in illustrated lectures and to acquaint students of engineering with the great variety of apparatus manufactured by the Company.

Interesting uses are made of the camera by E. L. Smidth & Co., manufacturers of cement machinery and engineers and designers of cement works. This company does not regularly employ a professional photographer but gets excellent results from employees who make exposures incidental to their other duties. On a big operation, such as the plant of the Olympic Portland Cement Company, which is now being constructed at Bellingham, Wash., a member of the field force skilled in the use of the camera takes views once a week or oftener, most of them panoramic or circuit pictures, sometimes 45 in. in length and 6 in. wide, which are forwarded to New York. The field man only makes the exposures, the negatives being sent to New York for development and printing. In this way executives in that city can post themselves at a glance as to the more noticeable



View of the Shop of the Pawling & Harnischfeger Company, Showing the Platform Device for Photographing Small Machine Parts



Sample of Pawling & Harnischfeger Renewal Sheet Showing a Reproduced Photograph of Parts Which Can Be Duplicated by Number

economically. The requests for illustrations received cover practically every branch of the photographic art, its experts being called on for portraiture work, interior work which frequently requires lengthy exposures, flashlight work, gen-

eral exterior views and making photographs at night to show how streets, parks and other places are illuminated by the various incandescent and arc lamps made by the company. Frequently, as with other companies, photographers are sent afield to obtain photographs for advertising and other purposes.

features of progress made at a point on the other side of the continent. Details of the work are shown in pictures made by smaller cameras also manipulated by the field man. These progress photographs, as they are called, are appended to the written reports of the work under way.

In the machine shops of the company at Jersey City, N. J., employees who know how to use the camera have instruments handy and frequently record jobs which are of unusual interest. New work is pictured, and there have been occasions when defects have been found after shipment where a photograph of the defective part has been returned instead of the part itself. In addition to the ordinary uses photographic prints are utilized by salesmen, sent to customers to supplement written descriptions and supplied to directors of plants to apprise them of the progress made in works in which they are interested. In a specially constructed steel cabinet in the New York office the company has pictorial records of its big accomplishments.

A good example of the utility of the camera is afforded by the uses made of it by the Pawling & Harnischfeger Company, builder of traveling cranes, which obtains excellent results from an 8 x 10 in. view camera. The Company's photographer, while subject to the direction of the advertising department, is required to do blueprinting for the drafting room. He makes photographs of all the special equipment turned out in the shops, views usually being taken from several positions which, aside from being used for advertising purposes are sent to prospective purchasers and also to the company's agents in the United States and Canada.

It has been a custom of the company's photographer in taking a picture of a machine, or part, to nearly always block out everything but the actual piece of apparatus desired in the picture, a method that has its disadvantages as well as its advantages, and which is not, of course, practiced when installation views are made. The blocking-out process is made easier by backing the apparatus to be photographed with white cloth. Were a white background not used it would be almost impossible to pick out wires, railings, bars, etc., in the negative, and therefore these parts might be eliminated from the picture.

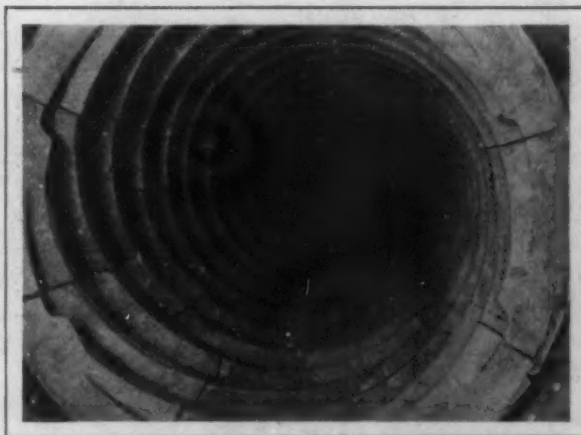
The conditions for taking pictures in the Pawling & Harnischfeger plant are most conducive to good work, the roofs being of the sawtooth type with the light coming from the north. The company's photographer stops down his lens to f. 64 and gives an exposure of about 7 min. on bright days and 10 to 12 min. on dull days. All standard component parts of the equipment manufactured by the Pawling & Harnischfeger Company, including motors and motor parts, shafts, wheels and gears, etc., are kept in stock and can be very easily duplicated at short notice through the use of what are known as renewal sheets. These sheets, which cover everything that can be replaced on all of the company's products, are made from photographs of the different parts, each of which is properly numbered. To facilitate the photographing of parts a special platform was built for the purpose, to which the camera is screwed, pointing downward upon the numbered parts spread out on a white sheet. The platform is substantial enough to support the operator who focuses the camera, makes the other adjustments and the exposure. The lighting in this instance is sufficiently regulated and shadows are avoided by a curtain before the nearby window. A card index is used to keep a record of what renewal sheets have been sent to customers.

The company has not done much copying of plans but had occasion to do so recently and met with good success. To save time and work for the draftsman the firm's printer set the titles of the drawings in type, a few proofs were struck off and then pasted into place on the drawing and photographed. The company's method of keeping track of its prints and negatives provides for the backing with cloth of one print from each negative. The reinforced prints are then bound in loose leaf form with the highest number on top, and while the file can be built up indefinitely, it is made certain that the pictures will remain together. Several duplicates are made of the prints for which there is the greatest demand, and these are filed to correspond with the numbers in the book. The negatives are numbered in such a way that the number

will appear directly on the finished print. Should it be necessary to make new prints the negatives are easily located through the number which appears on the corresponding print in the loose leaf book.

The Youngstown Sheet & Tube Company maintains a photographic department and makes all 'round use of the camera, including general view work, accidents, machinery, mill interiors, showing the processes of making different products, copying blueprints, drawings and maps, and, of course, extensively in advertising. The size of the pictures taken by the company's photographers are invariably 8 x 10 in. or 14 x 17 in., the cameras being manipulated by an employee selected from the office force of the company who is trained in photographic work. The firm has found it expedient to design and build special apparatus for a part of its work. The pictures made by the photographers of the company to show the progress of its new open-hearth plant and to some extent the methods employed in the building operations are almost perfect examples of their kind of work.

The Lackawanna Steel Company has an especially well-equipped photographic department, employs professionals for the work and makes practically every use of the camera which a modern industrial company can, among which may be enumerated: making permanent records of tests by photomicrographs, securing records in cases of accident, showing progress of construction where new work is undertaken, making reproductions of drawings for preservation and other purposes, etc. It has not been



Photograph Taken by F. E. Smidth & Co.'s Shop Photographer to Show the Interior of a Cooler or Device Used in Cement Making for Cooling the Clinker After It Leaves the Kilns and Also that There Were Some Uneven Joints in the Cast-Iron Spiral, the Latter Being One of the Reasons for Taking the Picture

found necessary to have special apparatus designed for its work, that obtainable in the market sufficing for all purposes. At the time of the raising of the battleship Maine many pictures were taken of the work by the company's own men for the reason that the steel piling used in building the cofferdam had been manufactured by this firm.

So many reproductions of photomicrographic pictures showing the structure of steel under varying conditions and demonstrating their value as a basis of comparison have appeared from time to time in *The Iron Age* that little need be said of that use of the camera beyond adding it to the utilities already referred to.

Acid Resisting Alloys.—It is reported that it has been proved possible to produce iron alloys which will entirely resist the corrosive action of acids, while the materials used and the articles produced can be manipulated by the usual methods of the workshop. The new alloys were prepared by Prof. Borchers, of Aix-la-Chapelle, by adding from 2 to 5 per cent. of molybdenum to an alloy of ferrochrome which contains practically little or no carbon, and at least 10 per cent. of chromium. An alloy composed of 36 per cent. of iron, 50 per cent. of chromium and a very little molybdenum was found to be insoluble even in boiling nitric acid, while it possessed all the solid qualities of iron and could be worked in the usual way. It is stated that the results obtained by adding titanium and vanadium were not quite so favorable.

Defects in Steel Ingots and Steel Rails

A Mechanical Method That Aided in Securing Sound Steel—The Prevention of Oxidation—Rails with Slightly Concave Base

BY J. B. NAU, NEW YORK

The report of James E. Howard on the broken rail in the Great Northern Railway wreck near Sharon, N. D., published in *The Iron Age* of July 11, 1912, induces the writer to submit some of his experiences with defects in steel and steel rails. In the same connection a description will be of interest, of a special pouring appliance that was in use in a large steel works with which the writer was connected for a number of years in the beginning of basic steel making, first as assistant, then as superintendent of the basic Bessemer converting works, and finally as superintendent of both the converting works and the rail mill attached. This pouring method was imported from le Creusot Steel Works in France. To the writer's knowledge it was in use in no other steel plant. It had for its purpose obtaining sound metal with fewer blowholes, less segregation and smaller piping, and it served its purpose well.

The Pouring Attachment Described

The appliance (Fig. 1) was what we called a "basket," because it looked like an egg-shaped brick-lined basket. It had a clear inside height of some 8 to 9 in. and it hung under the nozzle of the steel ladle above the molds. A transverse partition about 3 in. high divided the interior into two unequal parts; the larger of these formed a kind



Fig. 1—Section of Pouring Basket

of reservoir, in which the steel running from the nozzle of the steel ladle gathered in a pool until it ran over the shallow partition into the adjoining smaller funnel-shaped compartment. The bottom of the latter was a pouring nozzle with either one, two, three or four holes, through which the metal ran from the basket to the mold underneath.

The idea was to secure through this basket conditions known to give sounder metal with less segregation and less piping. The use of the basket, indeed, produces what Prof. H. M. Howe so judiciously recommended in his paper, "Piping and Segregation in Steel Ingots," published in Vol. 38 (1907) of the Transactions of the American Institute of Mining Engineers. The interposition of the basket between the ladle and the mold naturally cools the metal running into the mold. With the hottest heat a basket with the greatest number of holes in the nozzle was used, in order to increase the cooling surface of the pouring stream of metal.

The pressure of the metal falling upon the bottom of the mold is reduced to the height of the level of the metal in the basket, above the bottom of the mold. Reduced pressure gives less stirring of the metal below, which is allowed to solidify from the bottom upward. It also reduces considerably the splashing of the metal against the cold molds, which causes the numerous and often troublesome scales that are so often found on the ingots. Furthermore, the metal being always poured from the same height, all ingots will be cast under the same conditions of pressure. With the tall ladles now used, that must be of sufficient capacity to hold the whole heat from a 60 to 80-ton open-hearth furnace, the force with which the stream strikes the bottom plate is considerably greater than with the heat from a 10-ton converter. The advantages derived from the use of the pouring basket would now be much more marked, therefore, than with the old 10-ton heat.

An experience extending over many months showed us that the basket-poured ingots were uniformly so much sounder, so much freer from blowholes and segregation, with less piping, and invariably so much cleaner on the surface, that when the writer was requested to establish tonnage prices he was finally instructed to pay 4c. more

a ton for basket-poured ingots in order to encourage the use of the appliance.

Preventing Surface Cracks

While the basket was thus helpful in the elimination, or at least in the reduction, of some of the principal defects found in steel, it did not influence other defects. Among these may be mentioned horizontal surface cracks, which in some cases extended around the ingots, which they penetrated to a greater or less depth. These cracks, mainly due to the impurities still contained in the metal, were accentuated and in some cases directly traced to defective or worn-out molds; in others to a temporary stoppage in the pouring of the ingot. The solidifying steel will hang in a worn-out spot, prevent free contraction of the ingot below in a downward direction with the result that a horizontal crack will open in the surface of the still soft metal below the worn-out spot and under the weight of the metal below. The same crack may be produced, especially in a cold-pouring heat, if the pouring is stopped temporarily. With careful attention given to the molds in one case and with instructions to the pourer never to fully stop his pouring until the whole ingot was cast these cracks were largely avoided.

The Use of Deoxidizers

The primary cause of blowholes and kindred defects in steel being mainly oxide of iron remaining unreduced in the finished steel, and in those earlier days to a much larger extent than today, nearly every means was tried that was then known, to deoxidize the metal. Aluminum, probably the most powerful deoxidizer known even today, was then being introduced, but owing to the bad effect on the steel produced by even a small quantity of this metal, its use for some time received a serious setback, until it was finally demonstrated that it acted beneficially only as a deoxidizer, but in a deteriorating way as a constituent element of the steel. Naturally its use, after having been completely abandoned in some plants, was taken up again, but for fear of adding too much, often too little was added to get the full effect.

The fact that aluminum improved the metal but solely through its purifying action, so clearly established at a time when burnt or overblown steel was an everyday occurrence, in the then new industry, led the writer to state, in an article published in *The Iron Age* in 1892, that titanium, then in use nowhere as an addition in its metallic state to steel, would be found to act as a powerful purifier, nothing else. Treatment of titaniferous ore in a blast furnace in Colorado had shown him that the pig iron obtained therefrom was always of a quality superior to other iron, although no titanium was found in its composition. The addition of a powerful purifier to the metal in order to eliminate from it the oxide of iron, the principal cause of blowholes and segregation, without causing deterioration in the quality of the metal by its presence, produces a sounder, purer and stronger metal, that will have in its composition only what it is intended to contain. The simultaneous use of a pouring method of the kind above described, cooling the metal and hastening its solidification, would further help in the same direction and give clean ingots without surface scales.

Manganese and Sulphur

Other defects too well known to be more than mentioned were red shortness, the presence of too much sulphur, and heavy rephosphorization of the metal in contact with the slag. After some experimenting it was found that a pig iron with a high enough manganese content largely overcame these difficulties. After that an iron with never less than 1.2 per cent., and generally more, of

manganese was used. In connection with this manganese question the writer may say that some 10 years ago he treated in a 27-ton open-hearth furnace a charge containing 10,000 lb. of grate bars and 20,000 lb. of otherwise good basic iron but with somewhat less than 0.5 per cent of manganese. The steel contained more sulphur than the average of the charge. Sulphur was absorbed from the gas. Without removing any of the cheaper grate bars full of sulphur, the 20,000 lb. of basic iron was replaced by another basic iron with more manganese, but of the same market price, and the sulphur of the steel immediately fell below the average content of the charge.

Effect of Blowholes on Rolled Product

To what extent blowholes in those days became troublesome in steel obtained from, let us say, badly conducted heats was shown in a series of extended mechanical and heat treatment tests that the writer undertook at one time with soft and medium soft steel furnished by neighboring steel works, that were still somewhat behind the times in their steel making methods. These tests were to determine what would be the best brands of steel to be rolled into round bars and rods in a rolling mill then in the writer's charge. This steel was to take the place of excellent brands of puddled iron used up to that time in the manufacture of bolts, rivets, track screws, spiral bed springs and other forms. The steel was received in the shape of about 7 x 7-in. blooms, many of which were so full of blowholes that the core was detached from the outside shell. A length of particularly bad bloom was heated to a white heat and rolled down to a $1\frac{3}{4} \times 1\frac{3}{4}$ -in. billet. The worst part of this billet was cut off, heated again to a white heat and rolled into a $\frac{7}{8}$ -in. round. From this round a piece several inches long was cut off and the core driven out without the least trouble. The sample is still in the writer's hands.

Such defective blooms will give finished bars or rods, in which sections will be found where the inside core will not be welded to the outside. These spots in most cases can be traced without trouble by the seams that form on either side of the rod. Breaking or cutting the rod in the seamy part will nearly invariably show the existence of the defect.

After the experiments referred to such unsound blooms were carefully eliminated from the good ones, a lower price was paid for them and they were rolled into fence wire, for which a good paying market existed.

Another series of tests extending over several weeks showed that the best track screws were obtained from the use of soft steel by quenching the round bars immediately after they came from the finishing groove, in a trough of running cold water. This treatment made the metal tougher.

Rail Defects Due to Improper Heating or Rolling

Other defects found in rails are often due either to bad heating or to rolling in badly designed rolls. Among them may be mentioned laminations, seams and longitudinal cracks.

A flange rail is of an unsymmetrical shape in respect to its axis perpendicular to the web. Steel, unlike iron, does not spread much in the rolls; it elongates under pressure. If the roll tracing is not carefully established more pressure is liable to be put in the first grooves on the lower flange part than on the web. The flange has a tendency to elongate more than the web, giving rise to an internal strain somewhere in the junction of the flange and the web, in the finished rail, if in the subsequent grooves the effect produced is not wiped out. Under the repeated shocks of the passing trains, this internal strain may cause a longitudinal crack in the rail or at least it may powerfully contribute toward its formation.

Convex and Concave Rail Bases

For many months in succession the rails rolled at the mill referred to above were 60-lb. rails (30 kg. per meter) of the shape illustrated in Fig. 2. The base of the flange was straight as usual. Now it is known to every roller that when the rolls begin to wear out this base has a tendency to become convex, somewhat in the manner indicated by the lower broken line. Such a rail will rest on the central part of its bottom, while the ends will offer less support.

In a curve the great centrifugal force developed by fast-running heavy trains will suddenly be thrown with great power against the inside of the head of the outside rail, with a tendency to turn the rail slightly on the rounded base. Thereby the rail will be subject to more

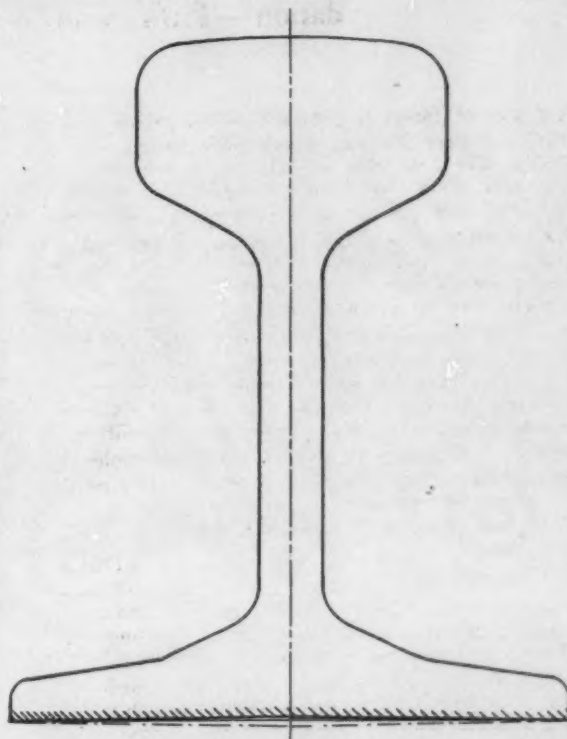


Fig. 2.—Section of Rail Showing Slightly Concave Base, Also Convex Base Which Is to Be Avoided

strains. To avoid this, the manager of one of the large rolling mills belonging to our company, a man of many years' experience in rail rolling and roll tracing, proposed to give the flange an originally concave shape in the manner shown on the sketch. [This method is used today in some rail mills.—Editor.] With this arrangement the rolls could wear out, but the rails had never a convex base. The modification was submitted to the railroad company, which readily accepted it. After that all rails were rolled in that manner.

In 1894 the late Prof. L. Tetmajer, then president of the testing department at the Polytechnic School of Zurich, Switzerland, was appointed a member of a commission charged to investigate the behavior of basic Bessemer rails in service, in order to determine if it was safe to use these rails on the main passenger tracks of the State Railroad of Hungary, where up to that time their use was not permitted. His report submitted the results obtained with acid Bessemer, basic Bessemer and open-hearth rails from many steel works. Many of these rails had been under observation for quite a number of years on different important lines.

Among the sections of track observed, two were laid with rails from the works with which the writer was connected at the time of the manufacture of at least one of the lots. This lot laid in a double-tracked section had been under observation for 7.27 years over a length of about $1\frac{1}{3}$ miles. The rails of this section were the best of all the rails submitted in Prof. Tetmajer's report. The other section, which was single-tracked, extended over the short length of about $\frac{1}{10}$ of a mile, had been under observation for two years only. The quality of the rails was in some respects a little above the average of those observed. It may be stated, however, that for obvious reasons the wear of rails will ordinarily be greatest in the beginning of their service. The rails made were mostly 60 and 72-lb. rails, with the following analysis:

Carbon, 0.35 to 0.45.

Phosphorus below 0.10.

Manganese, between 0.5 and 1 per cent, generally well above 0.5, sometimes above 1 per cent.

Sulphur, mostly between 0.03 and 0.04 per cent.

A New Small Steam Turbine

The Use of Velocity Stages a Special Feature of the New Class C DeLaval Prime Mover

The relative suitability of the several types of turbines in a given case is determined by the steam conditions, capacity and also the nature of the service as affecting the

bines exhausting to atmosphere or against back pressure, the friction of a large disk moving in dense steam consumes much power and largely counteracts the good efficiency obtained in the nozzles and buckets. As a result turbines in which pressure staging and velocity staging respectively or both combined are used have been widely introduced. The use of multiple-pressure stages is, however, open to the objection that to secure reasonable econ-

omy at the usual speed a large number of stages is required. The chief requirements for small turbines are safety, hardness and in many instances steam economy. These points have all been practically applied in the new line of velocity stage turbines recently brought out as the new class C turbine. Fig. 1 shows one of these turbines directly connected to a single-stage pump. Fig. 2 illustrates the shaft with the wheel, governor, packings and couplings assembled thereon, while Figs. 3 and 4 are views from above into the turbine casing and an end view respectively.

Fig. 2 shows the shaft with the wheels, governor, packings and couplings assembled thereon. The speed governor consists of two weights pivoted on knife edges and compressing a helical spring arranged with the axis concentric to that of the shaft.

The compression of the spring is accompanied by the forcing out of a pin which, as will be apparent from an inspection of Fig. 3, raises and lowers the double-seated poppet

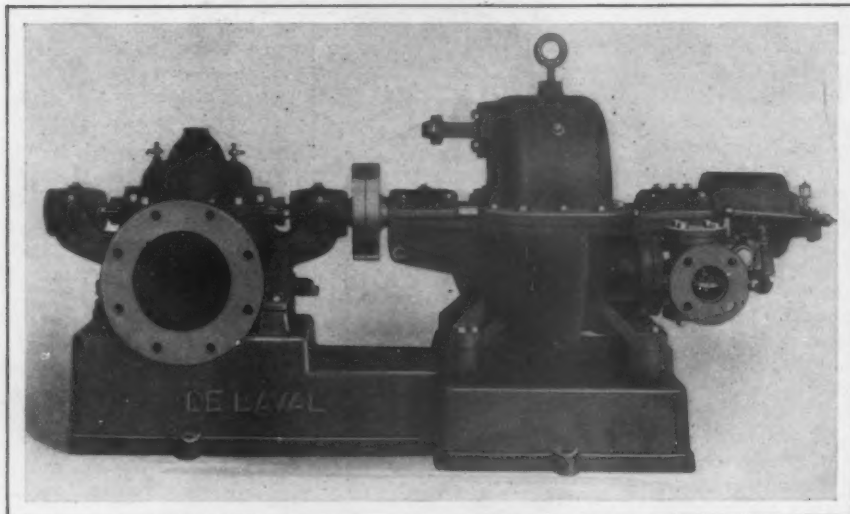


Fig. 1—A Single-Stage Pump Driven by a Direct-Connected New Small Steam Turbine Built by the De Laval Steam Turbine Company, Trenton, N. J.

speed. For each type of turbine there is only one correct wheel diameter and one speed and one number of stages for each capacity and set of steam conditions. In the single-stage turbine, built by the DeLaval Steam Turbine Company, Trenton, N. J., where the wheel runs at a speed giving a bucket velocity approximately half that of the steam expanded from the initial of the terminal pressure in one nozzle, the necessary reduction to the speed of the driven machine is obtained by helical spur gearing of the type which was illustrated in *The Iron Age*, April 13, 1911. Although this arrangement has given high steam economy for turbines of all sizes up to 500 hp., and its use greatly improves conditions for the driven machine, since it permits both the driving and the driven machines to run at their natural and most advantageous speeds, the additional cost involved has prevented the general introduction of the geared turbine in many situations where small power is required. Besides gears, there are four other solutions of the speed problem in the small turbine. These are: multi-staging with pressure stages, multi-staging with velocity stages, increasing the wheel diameter and reducing the bucket velocity. The last-named method, while permissible where all the exhaust steam can be utilized and while it gives an ideally simple turbine, does not permit the turbine to enter into competition where steam economy is a factor of considerable importance. Mechanical impracticability has limited the employment of a large wheel, only a small part of the periphery of which would be needed for developing power. In steam tur-

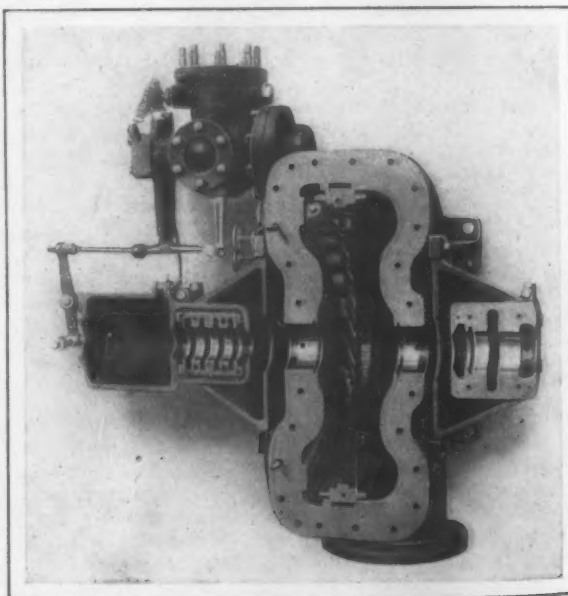


Fig. 3—View from Above Into the Turbine Case After the Rotating Parts and the Bearings Have Been Removed

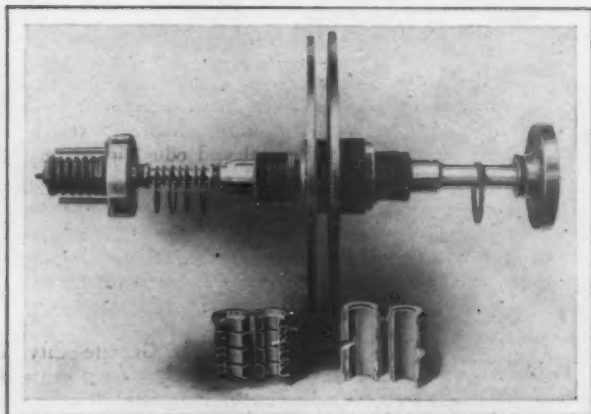


Fig. 2—The Shaft with the Wheels, Governor, Packings and Couplings Assembled Thereon

valve in the governor valve casing through a system of levers. The tension of the spring may be adjusted to give the speed regulation desired. The governor is completely inclosed in a stationary casing and, therefore there are no externally moving parts. While, it is pointed out, that by the use of this relatively simple governing device, close regulation is secured, as a precautionary measure, a second speed limiting device or emergency governor is employed. This consists of a radial bolt set in the disk which forms the base of the speed governor and is held in place by a strong spiral spring. When a certain predetermined speed is exceeded, however, this bolt will project and strike a small lever, Figs. 3 and 4, thus tripping the mechanism which closes the butterfly valve in the steam inlet opening. Fig. 1. This emergency governor is entirely independent of the speed governor and comes into action whenever a

certain limit is exceeded irrespective of the operation of the regular speed governor.

To prevent damage due to the rupture of the wheel through overspeeding, an inclosing armor is provided that forms a ring in which the stationary guide buckets are held, Fig. 3. This ring is made of steel and it is emphasized it effectually prevents the escape of fragments which might penetrate the ordinary cast-iron housing. The housing itself consists of two parts which can be readily raised to render the wheel, shaft and all interior parts accessible at once and the lower portion which contains the steam inlet and outlet openings. Both parts are definitely located with respect to each other by taper dowels to insure correct and easy assembling. To insure continuous operation for long periods under the care of unskilled labor, the rotating parts have been carefully balanced and the shaft employed is so proportioned that its critical speed is above that of the normal operating rate. It is pointed out that in this way absolute freedom from vibration is secured. The shaft used in this turbine is illustrated in Fig. 2, with the rotating parts mounted upon it. It is made of open-hearth steel, ground and polished over its entire length and is carried in two bearings, one of which is a plain ring-oiled bearing, while the other is a thrust bearing of the marine type and is intended to prevent endwise movement of the shaft, and thus hold the wheels in the proper position with relation to the nozzle and the stationary blades. As all the buckets are surrounded by steam at a uniform pressure, the turbine is balanced for axial thrust. The bearing brackets are supported directly on the turbine case casting and are separate and distinct from the stuffing boxes. In this way it is stated that it is impossible for steam or water to enter the bearings or oil reservoirs. The bearings are scraped to standard gauges, while the bearing shells are ground to standard dimensions to insure interchangeability.

The wheels are forged steel disks finished and ground on all surfaces and thickened toward the center to withstand rotating speeds far in excess of the normal one of the turbine. They are centered on the shaft by ground fits and are secured by Woodruff keys, the whole series being located on the shaft by a collar which is held in place by a heavy lock nut. Each wheel is balanced separately, as is also the entire series after being assembled on the shaft. Each wheel carries a single row of buckets which are of drop forged nickel bronze and are inserted in the rim of the wheel by bulb shanks fitted into slots milled and bored in the rim transversely to the plane of the wheel. It is pointed out that this mode of attachment develops the full strength of the bucket and at the same time permits individual buckets to be removed and replaced without disturbing any of the others. The bucket tips have projections front and rear which touch adjacent buckets to form a continuous rim, an arrangement which it is emphasized has proved beneficial in reducing the fan action in the blades and in guiding the steam jet. The guide vanes are similar in form and are attached in the same way to the retaining ring which is divided on the horizontal plane of the center line, the upper half being fastened to the wheel case cover, while the lower portion rests in a groove from which it can be lifted when the shaft and wheels are removed.

Another feature which characterizes this turbine is the ease of access to the parts for inspection, repair or replacement. All the internal parts are at once accessible upon removing the casing cover and without disconnecting the steam supply or exhaust piping. After the bearings have been removed and the coupling unbolted, the rotating member can be taken out, which gives access to all parts of the turbine, as is shown in Fig. 3. All the parts subject to wear are machined to limit gauges and are perfectly interchangeable so that they can be quickly and cheaply replaced.

The nozzles are solid bronze castings in which the orifice through which the jet is delivered is bored and reamed to the shape adapted to secure the desired ratio of expansion and the delivery of a jet free from turbulence. In the heel of the nozzle piece is a plugged hole through which access is had for machining the throat of the orifice. These nozzles communicate with the steam chest cored out in the wall of the wheel case and are held by nuts and sealed with copper gaskets. If it should at any time become necessary to replace them, as, for instance, if it



Fig. 4—End View of the Turbine Showing the Governor Which Controls the Balanced Valve, the Safety Governor Mechanism Which Operates the Butterfly Valve and the Handwheels of the Valves Controlling the Individual Nozzles.

should be desired to operate the turbine under steam conditions different from those for which it was originally designed the nozzles can be readily removed. Throttling is used to govern the turbine, and in the one illustrated in Fig. 4 six of the ten nozzles are fitted with hand controlled valves so that they may be cut out of service when the demand for power is light.

It is pointed out that the only way in which high pressure could accumulate within the casing would be through the stoppage of the exhaust outlet. To guard against any accident from this cause, however, an adjustable bronze safety valve is fitted to the upper part of the casing cover, as can be seen in Fig. 1.

Proposed Permanent Exposition at Washington

With Charles Freeman Johnson as secretary and manager, headquarters have been opened in the Southern Building, Washington, D. C., for a proposed World's Permanent Exposition in that city. A conference was held August 6 at the headquarters, at which were represented the States of New York, Pennsylvania, Maryland, Virginia and the District of Columbia. The conference is stated to have been enthusiastic, and such men as A. B. Farquhar, of York, Pa., a prominent manufacturer and identified with many movements for social uplift and conservation, consented to become members of the Advisory Committee. A bill has been introduced in the House of Representatives, providing for a commission consisting of the Secretary of State, Secretary of War, Secretary of the Treasury and four other persons to be appointed by the President, whose duty it shall be to investigate and report by bill or otherwise to Congress its findings and recommendations regarding the practicability of installing and maintaining at Washington a permanent exhibit illustrative of the natural, industrial and educational resources of the various States. The bill provides that the sum of \$25,000, or so much thereof as may be necessary, shall be appropriated for the purposes of the commission. At least two of the commissioners are to be men well versed in exposition theory and practice. Many Governors of States have already indorsed the project.

The American Steel Foundries, at Granite City, Ill., last week announced an increase in pay of 2 cents per hour generally to workmen paid by the hour. The advance was entirely voluntary by the company and was a surprise to the workmen.

Special Automobile Machinery

Details of Some of the Specialized Machine Tools Required to Produce Parts of Motor Cars

When the variety and number of duplicate parts produced each year for use in the automobile industry is considered it is easy to understand the demand that has recently existed for special machinery. This heavy demand indicates that the field offered for the special and automatic machines is very attractive. In fact, the evolution of the automobile industry has reached a stage that it is practically impossible for a manufacturer to produce automobiles successfully and meet competition without employing the most economical methods and labor-saving devices that it is possible to secure. This, of course, involves a large expenditure for equipment, which is practically prohibitive except in shops where a number of models are made and where these are produced in large quantities.

A fair estimate of the number of pleasure cars built in the United States alone during the 1912 season is 215,000. Practically all these are of the four and six cylinder types. The production of pleasure cars for the 1913 season, plans for which are now under way, according to estimates will be 300,000. In addition to this there is a large number of trucks and commercial cars, the production of which is rapidly growing, and according to indications may soon equal, if not exceed, the production of pleasure cars. In addition, the foreign automobile trade has also resulted in a heavy demand for American machinery. Automobile manufacturers in England, France, Germany and Italy were quick to take advantage of the high-grade automatic and special machinery produced in

this country for finishing the duplicate parts entering into the construction of automobiles and the demand for this class of machinery for export during the past few years has in some cases equaled the demand for domestic use.

The effect of the demand for special machines by the automobile trade during the past two or three years is shown by the condition of the machine tool trade. While manufacturers of standard tools such as lathes, planers, etc., have not been favored with a large amount of business from the automobile manufacturer, the builders of special machinery who were quick to realize the demand and produce the machines with high efficiency for this class of work have been rushed with orders. In many instances manufacturers are called upon to furnish a complete special machine designed and built for finishing individual automobile parts. The machines required in general are not of the heavy type, but must be built to produce work of extreme accuracy and at a minimum cost, almost regardless of the initial cost of the machine. Of course, as in the case of producing duplicate parts entering into the construction of any standard article made in large quantities, the greater demand has been for automatic machines, such as the automatic screw machine, which in many cases is provided with features especially suited to automobile work, and automatic machines for finishing parts made from drop forgings, steel, malleable, bronze and aluminum castings, and drawn sheet metal parts which require refinishing in order to get specified accuracy.

A battery of automatic chucking machines for finishing castings, forgings, etc., used in the gear department of the Flanders Mfg. Company, Pontiac, Mich., is shown in Fig. 1. These machines, approximately 25 in number, are used exclusively for finishing drop forgings and spur and bevel gear blanks. None of the parts are what would be



Some of the Special Automatic Machines Used in the Production of Large Quantities of Duplicate Automobile Parts in Plants of the Middle West

ties of Duplicate Automobile Parts in Plants of the Middle West

termed heavy work, the largest being about 18 in. in diameter. Therefore, extremely heavy machines are not required, as will be noted from the engraving. Automobile gears to a great extent are made from high-grade alloy steel, and to finish these within the close limits of accuracy required, single pointed cutting tools are necessarily employed. Broad facing tools will not do the work as in the case of cast iron and the more freely cutting materials. These gears are finished in two operations. The first operation consists of boring and reaming the hole and facing off the back of the gear. For the second operation the forging is held on a fixture screwed on the nose of the same type of machine, and the remainder of the work left from the first operation is completed. An ingenious arrangement of the tools for finishing the face and back angles of the gear is employed. The tools for taking both the roughing and finishing cuts on these surfaces are single point tools mounted on the turret and cross slide of the machine and controlled by cams.

A section of the motor department of the Sheffield Car Company's shops, Three Rivers, Mich., is shown in Fig. 2. Here it will be seen that automatic machines are employed for finishing cylinders as well as for finishing pistons, piston rings, timing gears and the heavier parts such as flywheels up to 30 in. in diameter entering into the construction of motors.

A battery of heavy special automatic machines used in the works of the Timken-Detroit Axle Company, Detroit, Mich., for finishing the heavier parts entering into the construction of axles such as hubs, brake supports, brake drums and the numerous parts of truck axles is illustrated in Fig. 3. In Fig. 4 is shown the first operation of the method of finishing a large truck hub on an automatic machine. This hub is $14\frac{1}{2}$ in. in diameter on the flange and 12 in. long overall. The material employed is cast steel. The rough casting is held in a heavy chuck fitted with special chuck jaws, and one end is finished all over without removing it from the machine. It will be noticed that a number of tools are cutting simultaneously. As a matter of fact the flange is faced, the barrel turned and the inside bored and reamed to receive the roller bearing, all cuts being taken at the same time. All of this work is done without removing the part from the machine. In order to give the cutting tools the rigidity required to maintain the close limits of accuracy, it will be observed that all boring bars, etc., have long pilots which fit and run in hardened steel bushings placed in the main spindle of the machine to support these bars.

A duplicate machine fitted up for finishing the second operation on the same hub is shown in Fig. 5. The arrangement of tools and method of chucking is clearly illustrated. As in the first operation all tools are rigidly supported while in operation so as to insure that each part produced is an exact duplicate of all the others. These machines are entirely automatic as far as the operation of the cutting tools is concerned, including the changes of speeds and feeds, and permits one attendant to handle four or five machines. This feature in connection with rapid production reduces the manufacturing cost to a minimum.

Fig. 6 shows a general view of the automatic department of the Weston-Mott Company, Flint, Mich. This is one of the largest shops in the world devoted exclusively to the manufacture of axles and rims. Owing to the extremely large quantity in which the various types of axles are produced automatic and special machines are employed practically throughout the whole works. In the department illustrated there are about 60 automatic machines built by the Potter & Johnson Machine Company, Pawtucket, R. I., specially for finishing hubs, gears, etc., and other departments are equally well supplied with special machines and devices for producing the work with the greatest accuracy and at a minimum cost.

Victor R. Browning & Co., builders of hoisting and conveying machinery, Cleveland, Ohio, call attention to the fact that on page 227 in *The Iron Age* of July 25 an error was made in stating that the Brown Hoisting Machinery Company had acquired the control of M. Beatty & Son's plant in Welland, Ontario, Canada. This plant is in control of the Browning interests of Cleveland. It manufactures dredges and other contractors' equipment.

Samples of Steel for Analysis

Suggestions as to the Proper Method of Taking Them by Drilling or Milling

BY JAMES H. HERRON*

Too little thought is usually given to the proper method of taking samples of steels for chemical analyses. Any chips that have been a part of the steel, regardless of where or how taken, size, uniformity or degree of cleanliness, are considered good enough for the chemist. Notwithstanding the carelessness with which a sample may be taken, the chemist is expected to make an accurate analysis. If an analysis is necessary, care in taking the sample is justified. The most satisfactory manner of taking a sample for analysis is by one of the following methods:

Drilling

Drilling is usually the more convenient method to use, and the following instructions should be followed: If possible use a diamond pointed drill. With this the drillings are broken up and of uniform size. If such a drill is not available, the ordinary twist drill may be used. In either case the drilling should be done at a slow speed and with a light feed. Under no circumstances use oil or other cutting compounds. Care should be taken to avoid the use of waste to wipe off any part of the sample from which the drillings are to be taken. Do not drill through the steel into a block of wood. Block the piece up with at least two blocks and drill between them. Care should be taken to avoid handling the sample. It is best to brush off the drillings on a smooth paper or directly into the sampling envelope.

If drilling across a bar, use a drill in size not more than one-half the diameter or side of the bar. For small bars drill entirely through the bar, as in Fig. 1, saving all the drillings. In large bars, drill to the center of the bar, as

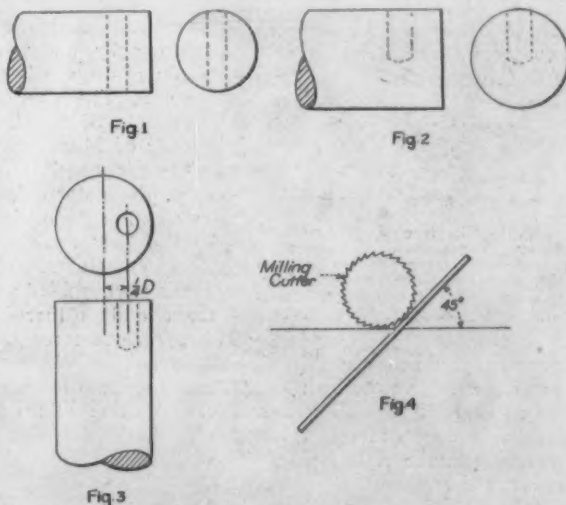


Fig. 1—Drilling Through the Bar
Fig. 2—Drilling to Center of Large Bars
Fig. 3—Drilling Parallel to Axis
Fig. 4—Milling for Sample of Strip

in Fig. 2. If the bar is too large to drill to the center, discard the first $1/16$ or $1/8$ in. If for a sample a short piece of the bar is available, it may be drilled parallel to the axis midway between the center and the circumference, as in Fig. 3. Thin bars or plates should be drilled entirely through, and all the drillings used.

Milling

Any millings are usually satisfactory. The first cut should always be discarded. The instructions regarding oil, cutting compounds or waste, as given above for drilling, should be observed. Where a thin strip or wire is available, the sample should be taken at an angle of 45 deg. with the axis of the piece, as in Fig. 4. For a complete analysis the samples should be between 1 and 2 oz.

Failure to observe the above instructions may introduce some foreign element and render the analysis worthless.

*Consulting Metallurgical Engineer, Cleveland, Ohio.

The Neco Low Water Alarm

A Device For Giving an Audible Signal When Unsafe Limits Are Reached

For giving a clear indication when the water in a boiler reaches either a dangerously low or high level, the Northern Equipment Company, 408 West Indiana street, Chicago, Ill., has brought out a device known as the Neco high and low water alarm. The operation of this device is based on the principle used in the Copes boiler feed regulator of this company, which was illustrated in *The Iron Age* January 12, 1911. The alarm comprises a whistle to which steam is admitted by the expansion and contraction of short metal tubes, the temperature of which and consequently their length depend upon the height of the water in the boiler.

Referring to Fig. 1, which is a view of the alarm, it will be noticed that the shorter tube, which is of steel, is connected to the point of low water in the water column and also to the water column drain. In this way steam cannot enter the tube and it is always filled with water, except when the water level in the boiler goes below the point of low water, generally the first gauge. When this occurs the tube fills with steam, which raises its temperature and causes it to expand. The expansion of this tube forces up the short arm of the lever and causes the whistle to be blown by the corresponding drop of the long arm. The other and longer tube of the alarm is made of Muntz metal and is connected at one end to the water column drain and at the other to the high water point of the water column. This tube is always filled with steam and is therefore always at that temperature except when water is above this point. When the water rises above the high level mark, the steam is cut off, radiation from the tube causes condensation and comparatively cool water is drawn up from the chamber or reservoir in the return pipe. This lowers the temperature of the tube, thus causing it to contract and pull down the lever which sounds the whistle. It will thus be seen that the device is entirely independent of the water column. None of the parts are hidden away and there are no floats to collapse, to become sticky and coated with slime and scale and no small levers to get out of adjustment.

A cross-section of the whistle valve used on the device is shown in Fig. 2. It works on the principle of a check, the steam pressure holding it closed and it is only when the lever presses it down that steam is admitted to the whistle. A baffle is placed at the point of entrance of the steam to prevent it from rushing in and exerting its force except at right angles to the disk of the valve. The valve is so constructed that it is filled with water except when the whistle is blowing, an arrangement which, it is pointed out, seals it and prevents any leakage of steam and wire drawing of the valve. If necessary

the alarm can be adjusted so that the whistle will not blow until the water has remained at the high or low water mark for 10 to 12 sec. or even as long as 2 min. if desired. The sounding of the whistle at high water depends upon the

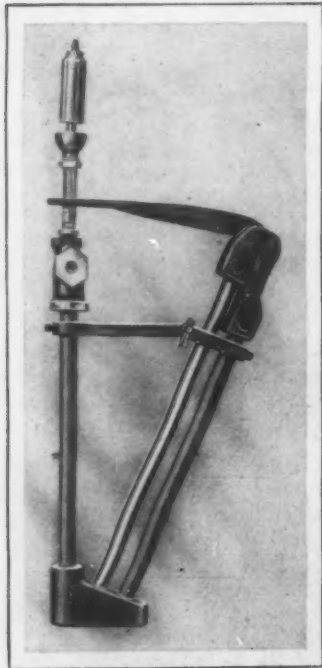


Fig. 1—The Neco High and Low Water Alarm Which Sounds a Whistle Whenever the Water Goes Above or Below Predetermined Limits Manufactured by the Northern Equipment Company, Chicago, Ill.

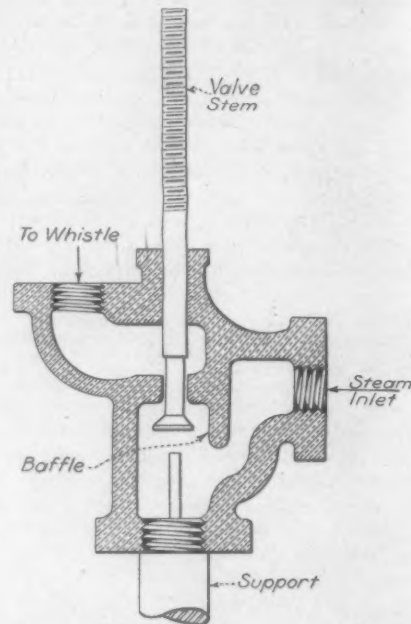


Fig. 2—Cross-Section of the Whistle Valve of the Alarm

cooling of the Muntz metal tube, as has been explained, and by turning the nut on the whistle valve spindle the alarm can be adjusted so that the whistle will not blow until the tube has contracted any desired amount. The maker recommends that ordinarily the alarm should be adjusted so that the whistle will blow in 20 sec., but in some plants it might be desirable to delay the sounding of the alarm until the water had been at the high water mark for 1 min. or even longer. The same time adjustment can also be secured in the sounding of the low water alarm.

In Fig. 3 the high and low water alarm is shown at the left, installed on a water tube boiler, together with the boiler feed regulator, which is shown at the right or rear end. The purpose of this regulator is to prevent accidents due to low water and also to prevent priming due to high water by supplying feed water in proportion to the amount of evaporation at an even high temperature. With the water below the center gauge the steam flows to the expansion tube and expands it with the heat, thus forcing it against the short arm of the bell crank lever. The arm in turn rises and by lifting the weighted toggle arm it opens the feed valve. Water flowing through this valve

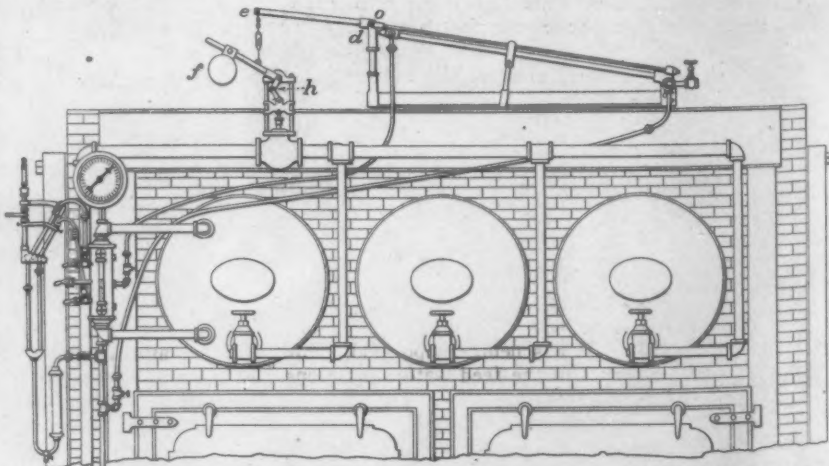


Fig. 3—A Neco High and Low Water Alarm and a Neco Regulator Installed on a Water Tube Boiler

now raises the level until the opening to the riser at the center gauge is sealed and the steam supply cut off. The steam already in the tube condenses, and as the tube is thus deprived of the heat required to keep it expanded it contracts

now raises the level until the opening to the riser at the center gauge is sealed and the steam supply cut off. The steam already in the tube condenses, and as the tube is thus deprived of the heat required to keep it expanded it contracts

and draws back the arm *od* and lowers the arm *oe*, which in turn permits the weighted toggle arm to force the feed valve shut by gravity. In use the arc of the point *h* is

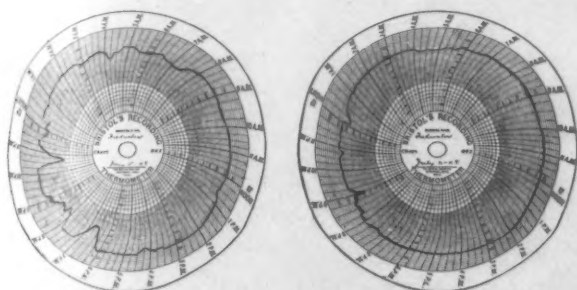


Fig. 4—Two Feed Water Temperature Charts Taken in a Lighting Plant, the One at the Left with Hand Regulation and the Other When the Boiler Was Fed by a Neco Regulator

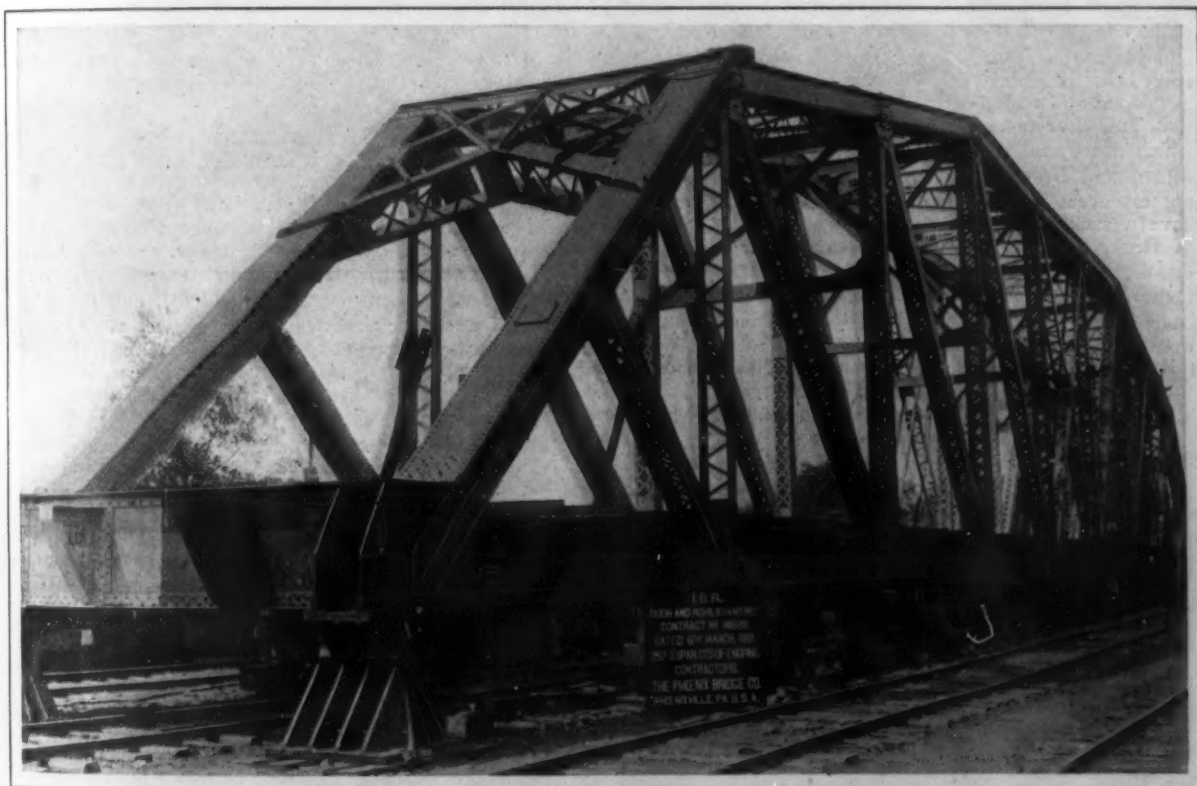
such that when the arm *f* is raised the motion is at first slight and the valve is opened only a small distance. As the point *h* travels upward the speed of the motion is increased. In closing the valve the reverse is true. As the contracting tube allows the arm *f* to force the valve shut, the closing is at first rapid and then so slow that before the contraction is complete and the valve entirely closed

A Phoenix Railroad Bridge for India

The Phoenix Bridge Company, Phoenixville, Pa., shipped the first installment of the steelwork for a 12-span bridge to Calcutta, India, on July 17. This bridge is being built for the Oudh & Rohilkhand Railway, which forms a part of the State system in India and is to be erected over the Jumna River near Delhi.

The bridge consists of 12 spans of the through riveted joint type, measuring 257 ft. 3 in. between the centers of the piers. The bridge is designed for a single track and is of the English type, having been designed by Sir Arthur Rendel, of Rendel & Robertson, consulting engineers, London, England. The specifications provided for the complete temporary erection of each span before shipment and the accompanying engraving shows one of the spans assembled at the builder's shop. In assembling and erecting the span in the shops ordinary fitting-up bolts and drift pins were employed. As will be noticed from the engraving each half span is painted a distinct and different color, the purpose of this being to facilitate the assorting of the material and the erection of the bridge when it reaches its destination.

The contract for this bridge, which requires some 4500 tons of structural material, was taken in strong competition with English and Continental bridge builders, the contract being dated March 6, 1912. Shipments will be made in lots of four spans, each about a month apart, delivery



One of the Four Spans of 12-Span Railroad Bridge Recently Built and Shipped to India by the Phoenix Bridge Company, Phoenixville, Pa.

a fresh supply of steam to the expansion tube has arrested the process of contraction. In this way it is pointed out that by slowing down with the toggle the action of the regulator is made so gradual that with the water above the water gauge it is feeding somewhat less than the amount evaporated and with the water level below the center gauge it is feeding slightly more than is being evaporated. The uniformity of the temperature of the feed water where one of these regulators is employed is clearly brought out in Fig. 4. This is a reproduction of two feed water temperature charts taken in a lighting plant. The chart at the left was taken when hand regulation was employed, and it will be noticed that there are wide fluctuations in the temperature of the feed water. The chart at the right was taken when the boiler was fed by one of the company's regulators, and it will be seen that the fluctuations present in the other chart have been greatly straightened out, the feed water temperature being practically constant.

being made to the Indian State Railway at Calcutta. The heaviest member to be transported and handled weighed about 6 tons and the length of the longest member in the shipment was 45 ft.

The annual dinner of the Metal Trades Superintendents' and Foremen's Club, Cleveland, Ohio, will take the form of an outing which will be held at the Maple Cliff Villa Club August 24.

At a recent meeting of the board of directors of the Warren Tool & Forge Company, Warren, Ohio, George E. Warner, of that city, was elected director and treasurer, and William L. Klingelhofer, president American Foundry & Construction Company, Pittsburgh, became a director.

Double Head Shaping Machine

In the application of electric drive to the Cincinnati Shaper Company's type B two-head shaping machine an example is afforded of the use of constant-speed motors for machine tools requiring different cutting speeds. The drive is supplied by $7\frac{1}{2}$ -hp. constant-speed induction motors built by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., and operating at a speed of 705 r. p. m. Each head is driven by a separate motor designed for continuous service on an alternating-current circuit. The power is transmitted to a gear box and in this way eight changes of speed of the ram, which give a range sufficient for working all kinds of metal, are obtained. Four of these speeds are rendered available by the use of the gear box while the other two, which are 158 and 205 r. p. m., are obtained by transposing change gears. A front view of the machine is given in Fig. 1, and Fig. 2 is a rear view showing the location and arrangement of the driving motors.

As will be noticed from these engravings the bed is of box form and is wide and of the full depth both front and back. To give extreme rigidity it is strongly reinforced by ribbing. The saddles which carry the rams have long and wide bearings, both on the bed and for the ram, and have taper gibs for taking up wear. The rams which are operated by a Whitworth motion have a quick return and by reason of their design it is pointed out they possess great stiffness and ample bearing surface. They have a rack and pinion for positioning, both for length of stroke and for location over the work. In this way it is pointed out that a very convenient and positive method for accomplishing this result is secured. The heads are strong and substantially constructed and have a variable automatic feed and the feed screws have micrometer collars reading to 0.001 in. A worm hand feed for concave work is also provided. The feeds are located at the end of the bed and can be operated either by hand or power and in the latter case are adjustable while the machine is running by the small crank handle located on the bell crank toward the lower part of the end of the machine. A safety device is also provided for the feed which operates when the saddle meets with an obstacle.

The aprons have three bearing surfaces on the bed and have pinion wrenches to control their movements. The box tables are adjustable vertically on the aprons

coarse pitch and large diameter and has wide faces. These machines are built with beds ranging in length from 78 in. to 20 ft. with one or two heads. Any length of stroke from 18 to 26 in. is available, the machine illustrated having a stroke of the maximum length and a bed 14 ft. long. These machines can also be built for a belt

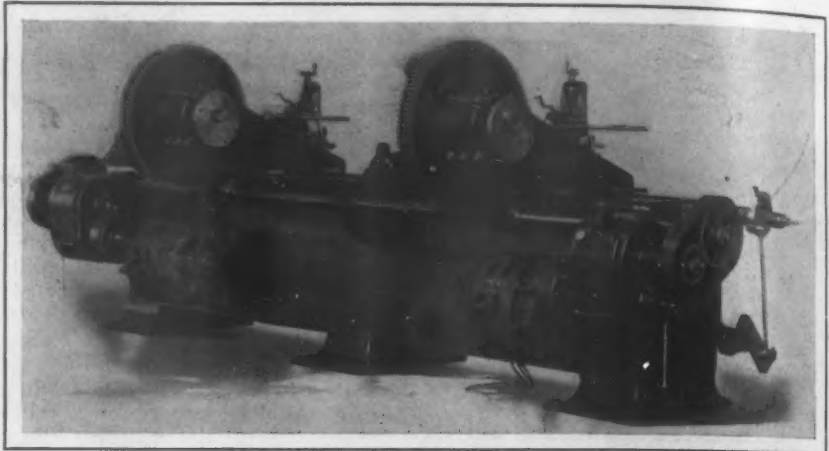


Fig. 2—Rear View of the Machine Showing the Westinghouse Constant-Speed Motor Drive

drive. The equipment furnished with each machine includes a No. 4 double screw vise and all the necessary wrenches.

A California Iron and Steel Project

A correspondent states that the California Industrial Company is planning the erection of an iron and steel plant at Wilmington, a suburb of Los Angeles, where it has purchased 40 acres of land and taken options on an additional tract of 260 acres. Iron ore deposits in southern California and Mexico have been acquired, and crude oil will be used as fuel. It is stated that the financing of the enterprise has been virtually completed, and that preliminary work will commence within six weeks. Among the interested parties are some of the wealthiest residents of Los Angeles. The plans contemplate the erection of blast furnaces, open-hearth steel furnaces, rail mills and other finishing mills. It is said that by a new system of using crude oil, and the employment of specially designed burners, the use of coal and coke will be entirely dispensed with. Natural gas will also be largely employed.

The California Industrial Company has operated for several years a small iron plant in Los Angeles, using scrap iron for raw material. Several months ago the management closed the little plant and commenced negotiations for the erection of a large establishment. S. I. Merrill, of Los Angeles, is general manager.

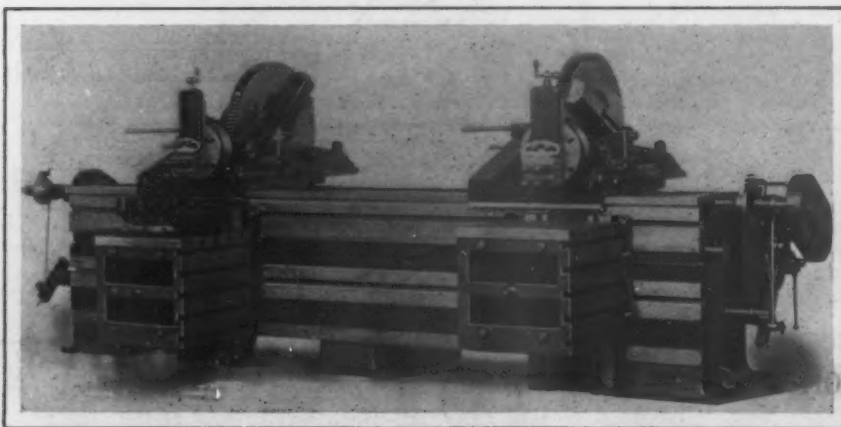


Fig. 1—Front View of the Type B Shaping Machine Built by the Cincinnati Shaper Company, Cincinnati, Ohio

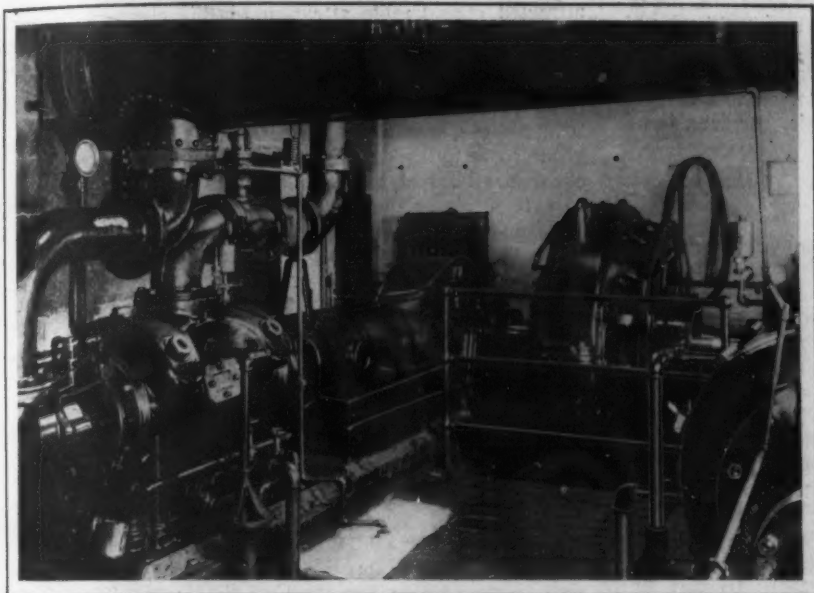
and horizontally with them along the bed. Each table is planed all over and has planed T slots on all three sides. The gibs for taking up wear, like all the others used in the machine, are of the taper type. The taper elevating screws are hung on ball bearings. The gearing is of

At the Kroman mine at Republic, Mich., the Jones Furnace Company is remodeling its Ardis furnace. The principal alteration is that the big cylinder in which the ore is "metallized" will be changed from a horizontal to a vertical position for a test of the plant on copper ores.

The sale under foreclosure of the St. Louis Blast Furnace Company's plant was prevented by a Federal court injunction obtained by the Whitney-Kemmerer Company in July, but which it had been understood would not be enforced. Enforcement was announced after the prospective bidders had assembled August 16. There were several in attendance, including representatives of a Cincinnati concern which has plans, if it can purchase the plant, to open and operate it. The plant has been closed for about a year. The Whitney-Kemmerer interest has since expressed a willingness for the sale to proceed with a minimum bid of \$200,000.

Motor-driven Air Compressor

An interesting example of the many advantages of the electric drive for air compressor work is afforded by the installation of a compressor at the Park works of the Crucible Steel Company of America, Pittsburgh, Pa. As will be noticed from the accompanying engraving, which shows the compressor in operation at the plant, the motor is directly connected to the compressor. The advantages claimed for this arrangement are the elimination of an intermediate transmission system and a decrease



An Ingersoll-Rand Air Compressor in the Plant of the Crucible Steel Company of America Equipped with Motor Drive Supplied by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

in the amount of floor space required which is frequently an important item in crowded shops or plants.

The compressor was built by the Ingersoll-Rand Company and is what is known as the Class P two-stage medium duty type. The low pressure air cylinder measures $20\frac{1}{4}$ in. in diameter, while the high pressure cylinder is 8 in. smaller. The stroke is 18 in. and at the rated speed of 180 r. p. m. a piston displacement of 1117 cu. ft. per min. is obtained. The air is compressed to 100 lb. per sq. in. and is maintained automatically at this pressure by a governor located on the air intake pipe of the low pressure cylinder.

The air after leaving the compressor is led to a large iron receiver just outside the compressor room. From here it is piped to different parts of the works for performing various functions, the principal one being that of operating pneumatic tools.

The motor driving this compressor was manufactured by the Westinghouse Electric & Mfg. Company and has a capacity of 210 hp. at a speed of 200 r. p. m. It is mounted between the high and low pressure sides of the compressor and is designed for operation on a 220-volt direct-current circuit. The speed of the motor, which is compound wound and has communicating poles, is constant. Cast steel is employed for the frame and there are air spaces in the windings. A multiple switch starter mounted on a slate panel located in one corner of the room controls the motor and this can be stopped instantly by a push button which opens the automatic switch or the circuit breaker on the panel. This type of motor, it is emphasized, forms an ideal method of drive for air compressor work as it is characterized by sparkless commutation and cool operation. The commutating poles insure sparkless commutation at all loads and on account of the open type of construction excellent ventilation is secured and the air is permitted to reach the windings. The outfit runs for the entire 24 hr. with the exception of the time between the shifts which is taken for cleaning and inspection.

July imports of merchandise exceeded exports to the value of \$1,332,998.

German Sand-blast Apparatus

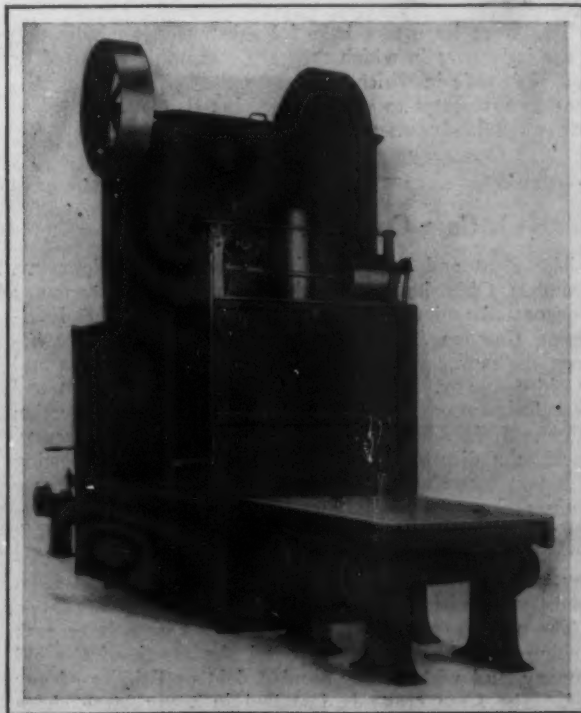
BY ROBERT GRIMSHAW

American sandblast apparatus for cleaning castings was adopted at first very slowly in Germany. Now, however, the Germans are getting ready to make special apparatus to adapt it to various particular conditions. Among the manufacturers of this class of apparatus are Vogel & Schemman, Kabel, Westphalia, and one of the machines built by this firm which is intended principally to clean medium gray iron and malleable iron castings is illustrated herewith. One of the objections to the former machines of this builder was that in addition to the air which was driven through by the compressor the outer air was also sucked in with the result that the capacity was diminished.

The machine consists principally of a rectangular table with automatic reciprocating motion and anti-friction roller bearings. In the machine illustrated the jet has a wide slit, although in another machine built by the same manufacturer there are several round jets, the number varying with the width of the table. The air supply in this type of machine which is intended for light castings is received from a high pressure fan or blower, while where a number of round jets are used the air is supplied by a compressor.

The sand elevator returns the used sand to the supply hopper and an exhauster removes the dust. The pieces to be cleaned

are laid on a table and after one side has been freed from sand, etc., they are turned and the opposite side is treated in a similar manner. The table is substantially built to carry castings ranging from 1 to 6 tons, according to the size of the machine. The stroke of the table is variable from a little more than half its length beyond the jets to any desired smaller distance. There is a slight pause at the end of the stroke and time is given to turn the smaller pieces. The table is 32 in. from the floor,



A Type of Sand Blast Apparatus for Light Castings Built by Vogel & Schemman, Kabel, Germany

which is a convenient height at which to handle the castings. The heavier pieces are handled by a crane.

Where the machines are used for larger pieces, the object is not only to remove the sand, but also fins and the outer crust to permit tinning or similar treatment. The use of compressors, however, with high pressure blast, does not permit the employment of fixed slit jets, as these would consume too much power and call for too expensive compressors. Here it is desirable to use a greater number of circular jets ranging in diameter from 0.4 to 0.45 in. As these, however, would blast only small areas, they are movable horizontally across the table and the arrangement for doing this permits them to act either vertically or obliquely and at various heights.

The apparatus illustrated will handle castings up to a height of 14 in. satisfactorily and if desired this distance can be increased from 18 to 20 in. This, however, is not recommended for flat pieces.

New York State Labor Department and Industrial Diseases

The New York State Department of Labor is sending a booklet on diseases of industrial workers to 14,000 physicians, hospitals and dispensaries in the State. For the purpose of preventing such diseases as are directly due to industrial processes, reports of certain diseases of occupation are now required by law to be filed with the department by physicians practicing in the State.

It is the intention of the department to inform manufacturers and physicians of preventive and safer industrial methods, and it is expected that with the assistance of the medical profession, the necessary facts will be gathered not only as to the six reportable diseases, but also as to any other diseases clearly attributable to employment. To this end the department's quarterly bulletin, containing material on industrial diseases, is circulated widely among manufacturers.

In the booklet now going out it is stated that more than \$366,000,000 was lost in wages because of 13,400,000 cases of sickness among wage-earners in the United States last year. In a pamphlet just issued by the New York Association of Labor Legislation's Committee on Industrial Diseases it is stated that "special uses of nerves and muscles bring about their definite occupational diseases in the operation and control of machinery, and special strains result from lack of variety in work, from concentration, and from the haste involved in competition or speeding up."

The more important harmful substances, an indication of the industries in which they are commonly prepared or used, the mode in which they enter the body, and the diseases or symptoms to which they give rise, are printed in four parallel columns as a guide to the physician.

Case Crane Reorganization

The plant and business of the Case Crane Company, Columbus, Ohio, have been taken over by a new company incorporated under the name of the Case Crane & Engineering Company. There is no connection whatever between the new company, its stockholders and officers and the old company. Paul T. Norton, the new president and general manager, is well-known through his connection with the Jeffrey Mfg. Company and other large interests. Among the directors and stockholders are the following prominent manufacturers: S. P. Bush, president Buckeye Castings Company; J. F. Stone, president Seagrave Company; J. A. Jeffrey, president Jeffrey Mfg. Company; Col. James Kilbourne, president Kilbourne & Jacobs Mfg. Company; O. A. Miller, president Ohio Paper Company; J. H. Frantz, vice-president Columbus Iron & Steel Company.

The new company will start business with a large cash working capital, in addition to all the assets of the old company, and without any bonded debt or liability of any kind. The Case crane is installed in many large shops throughout the world, and the new company expects not only to expand its domestic business but will make an effort to extend its export trade.

Missouri Iron Ore Deposits

The annual report of State Geologist H. A. Buehler, of Missouri, just out, adds considerable interesting information to that already known regarding the iron ores of Missouri. After referring to the history of the ironmaking industry in Missouri in the days of Iron Mountain and to the later development in the Pilot Knob section where the Puxico Iron Company is shipping 3000 tons of ore monthly to Ohio furnaces, he devotes particular attention to the brown ores of southeast and southwest Missouri. He says that the partial development of these bodies in recent years has attracted considerable attention to this class of deposits. The brown ores have been produced chiefly since 1900, and up to the present time comparatively few of the deposits have been worked in a systematic manner or under conditions favorable to cheap production or large recovery. While these ores were formerly considered of too low grade to be utilized, they are shown in this report to be equal in all respects to the limonites which are produced so extensively in the Southern States.

Usually, the report says, the brown ore deposits are not large, and in many instances the smaller ore, which comprises a considerable proportion of the deposits, can be recovered only by washing, but in most cases a simple log washer, one that can be dismantled and transported easily, is found to be best for the greatest returns on the investment. In exceptional cases only will the size of the deposits justify the larger or more expensive plants.

Inadequate transportation facilities in the Ozarks, Mr. Buehler says, are responsible for the lack of development in many parts of that district, where the hematites in some of the old mines are being exhausted. For this reason promising properties are not being mined. The most important factor besides transportation, according to the report, is adequate smelting facilities for the ores occurring in the southeastern part of the State. There is no furnace now in blast that can absorb the ores of either the primary or the secondary limonite districts, and as a consequence in the last year practically no ores of these types have been produced. Pilot Knob has operated all the year, but the ores have been shipped to Ohio and the East.

Mr. Buehler is positive that the ore production of the recent past represents but a small fraction of what can be produced from the Missouri deposits if they are properly developed. He shows by statistics that approximately 62 per cent. of the total production of the State has been derived from the deposits of specular hematite in the St. Francois Mountain, 34 per cent. from the red and specular hematite deposits of the Ozarks and only 3 per cent. from the brown ores. But the brown ores are the hope of the future, and all of them will be carefully brought to market, Mr. Buehler believes. The brown ores are the primary and secondary limonites. They are found in both southeast and southwest Missouri. The secondary limonites are found in very widely scattered locations and occur in a majority of the counties south of the Missouri River. The greatest and best deposits are found in the south and southeast parts of the State on the margin of the Ozark plateau. The primary limonites are found in a narrow belt bordering the lowlands in southeast Missouri and passing through Bollinger, Wayne, Ripley and Butler counties. They are also found in a small territory in southwest Missouri. The belt in the southeastern part of the State is of chief importance and is about 15 miles wide and 100 miles long.

The report says that a large proportion of these ores are available, and, moreover, the conditions under which they are found are highly favorable to economical mining. Almost invariably the primary limonites occur upon or near the crest of hills and the deposits have usually a much greater extent laterally than elsewhere. The greater part of such ore needs only hand separation in mining or a picking belt. If the market permitted, many of these deposits could be worked with steam shovels. Ore has been mined under rather favorable conditions, at about \$1 per ton.

Pittsburgh's twenty-fourth annual exposition will open August 28 and close October 19. A most attractive prospectus has been issued by the Western Pennsylvania Exposition Society, of which T. J. Fitzpatrick, Exposition Building, Pittsburgh, Pa., is general manager.

Structural and Boiler Steel Specifications

A Recent Revision of the Standards Long in Use by the Association of American Steel Manufacturers

The Association of American Steel Manufacturers has just published a revision of the well-known manufacturers' standard specifications for structural and boiler steel. At a special meeting of the association held in Pittsburgh, June 28, the new specifications were ordered sent to letter ballot, and this has resulted in their adoption. The association's specifications which now go out of use date back to August, 1895, at which time they represented pioneer work. They have stood essentially as first adopted, later revisions being of a minor nature; and there has been no change since 1903, until the present rather sweeping revision. In the past nine years much progress has been made in the technical associations toward standardizing the physical and chemical requirements for steel, and the revision of the manufacturers' standard specifications is in line with this movement. The character of the differences between the new manufacturers' specifications and those of the engineering societies, for example, the American Society of Testing Materials, could only be indicated by printing the two sets side by side. One difference, which appears on first inspection, is that in the American Society of Testing Materials specifications for structural steel, no distinction is made as in the specifications of the manufacturers between highway bridges and railroad bridges.

In connection with the new specifications, which are printed below, attention is called to a new feature, in the separation from the text of the specification, of the usual schedule of allowable variations in the weight, etc., of sheared plates. This schedule, together with the tables of standard allowable variations in the size and weight of hot rolled bars, now appear under the caption of "Manufacturers' Standard Practice," as an appendix to the specifications.

It is announced that copies of the booklet will be furnished free on application to the secretary of the Manufacturers' Association, Jesse J. Shuman, Jones & Laughlin Steel Company, Pittsburgh.

Structural Steel

Grades

1. These specifications cover three classes of structural steel, namely:

Class A steel, to be used for railroad bridges and ships.

Class B steel, to be used for buildings, highway bridges, train sheds and similar structures.

Class C steel, to be used for structural rivets.

I. Manufacture

Process

2. Steel for Classes A and C shall be made by the open-hearth process. Steel for Class B may be made either by the open-hearth or by the Bessemer process.

II. Chemical Properties and Tests

Chemical Composition

3. The steel shall conform to the following requirements as to chemical composition:

Elements considered.	Class A steel.	Class B steel.	Class C steel.
Phosphorus, max., per cent:			
Basic open-hearth	0.04	0.06	0.04
Acid open-hearth	0.06	0.08	0.04
Bessemer		0.10	
Sulphur, max., per cent.	0.05		0.045

Ladle Analyses

4. To determine whether the material conforms to the requirements specified in section 3, an analysis shall be made by the manufacturer from a test ingot taken during the pouring of each melt. A copy of this analysis shall be given to the purchaser or his representative, if requested.

Check Analyses

5. A check analysis of Class A and Class C steel may be made by the purchaser from finished material representing each melt, in which case an excess of 25 per cent. above the requirements specified in section 3 shall be allowed.

III. Physical Properties and Tests

Tension Tests

6. The steel shall conform to the following requirements as to tensile properties:

Properties considered.	Class A steel.	Class B steel.	Class C steel.
Tensile strength, lb. per sq. in.	55,000—65,000	55,000—65,000*	46,000—56,000
Yield point, minimum, lb. per sq. in.	0.5 tens. str.	0.5 tens. str.	0.5 tens. str.
Elongation in 8 in., min., per cent.	1,400,000†	1,400,000†	1,400,000
	tens. str.	tens. str.	tens. str.
Elongation in 2 in., min., per cent.			
(Fig. 2)	22	22	

Yield Point

7. The yield point shall be determined by the drop of the beam of the testing machine.

Modification in Tensile Strength

8. Class B steel may have tensile strength up to 70,000 lb. maximum, provided the elongation is not less than the percentage required for 65,000 lb. tensile strength.

Modifications in Elongation

9. (a) For material over $\frac{3}{4}$ in. in thickness, a deduction of 1 from the percentage of elongation in 8 in. specified for Classes A and B in section 6 shall be made for each increase of $\frac{1}{4}$ in. in thickness above $\frac{3}{4}$ in., to a minimum of 18 per cent.

(b) For material under $\frac{5}{16}$ in. in thickness, a deduction of 2.5 from the percentage of elongation in 8 in. specified for Classes A and B in section 6 shall be made for each decrease of $\frac{1}{16}$ in. in thickness below $\frac{5}{16}$ in.

Character of Fracture

10. All broken tension test specimens shall show a silky fracture.

Bend Tests

11. (a) The test specimen for plates, shapes and bars shall bend cold through 180 deg. without fracture on the outside of the bent portion, as follows: For material $\frac{3}{4}$ in. and under in thickness, flat on itself; for material over $\frac{3}{4}$ in. up to $1\frac{1}{4}$ in. in thickness, around a pin the diameter of which is equal to $1\frac{1}{4}$ times the thickness of the specimen; and for material over $1\frac{1}{4}$ in. in thickness, around a pin the diameter of which is equal to twice the thickness of the specimen.

(b) The test specimen for pins and rollers shall bend cold through 180 deg. around a 1-in. pin without fracture on the outside of the bent portion.

(c) A rivet rod shall bend cold through 180 deg. flat on itself without fracture on the outside of the bent portion.

(d) Bend tests may be made by pressure or by blows.

Test Specimens

12. (a) Tension and bend test specimens shall be taken from the finished rolled or forged product, and shall not be annealed or otherwise treated, except as specified in section 13.

(b) Tension and bend test specimens for plates, shapes and bars, except as specified in paragraph (c), shall be of the full thickness of material as rolled, and with both edges milled to the form and dimensions shown in Fig. 1, or may have both edges parallel.

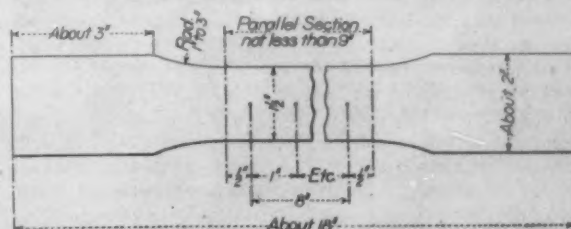


Fig. 1.

(c) Tension and bend test specimens for plates and bars (except eye-bar flats) over $1\frac{1}{4}$ in. in thickness or diameter may be turned or planed to a diameter or thickness of at least $\frac{3}{4}$ in. for a length of at least 9 in.

(d) Tension and bend test specimens for pins and rollers shall be taken parallel to the axis, 1 in. from the surface of the bar.

*See section 8. †See section 9.

Tension test specimens shall be of the form and dimensions shown in Fig. 2. Bend test specimens shall be 1 in. by $\frac{1}{2}$ in. in section.

(c) Rivet bars shall be tested in full-size section as rolled.

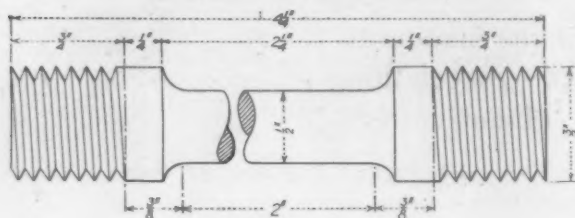


Fig. 2.

Annealed Specimens

13. Test specimens for material which is to be annealed or otherwise treated before use, shall be cut from properly annealed or similarly treated short lengths of the full section of the piece.

Number of Tests

14. (a) At least one tension test and one bend test shall be made from each melt. If material from one melt differs $\frac{3}{4}$ in. or more in thickness, tests shall be made from both the thickest and the thinnest material rolled.

(b) If any test specimen develops flaws, or if an 8-in. tension test specimen breaks outside the middle third of the gauge length, or if a 2-in. tension test specimen breaks outside the gauge length, it may be discarded and another specimen substituted therefor.

(c) Material intended for fillers or ornamental purposes will not be subject to test.

IV. Permissible Variations in Weight and Gauge

Permissible Variations

15. (a) The sectional area or weight of each structural shape or rolled-edge plate shall not vary more than 2.5 per cent. from theoretical or specified amounts.

(b) The thickness or weight of each sheared plate shall conform to the schedule of permissible variations, Manufacturers' Standard practice, appended to these specifications.

(c) The weights of angles, tees, zees and channels of bar sizes, and the dimensions of rounds, squares, hexagons and flats, shall conform to the Manufacturers' Standard practice governing the allowable variations in size and weight of hot-rolled bars, appended to these specifications.

V. Finish

Finish

16. The finished material shall be free from injurious defects, and shall have a workmanlike finish.

VI. Marking

Marking

17. The name of the manufacturer and the melt number shall be legibly marked, stamped or rolled upon all finished material, except that each pin and roller shall be stamped on the end. Rivet and lattice steel and other small pieces may be shipped in securely fastened bundles, with the above marks legibly stamped on attached metal tags. Test specimens shall have their melt numbers plainly marked or stamped.

VII. Inspection and Rejection

Inspection

18. The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the material is being furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

Rejection

19. Material which, subsequent to the above tests at the mills and its acceptance there, develops weak spots, brittleness, cracks or other imperfections, or is found to have injurious defects, may be rejected at the shop, and shall then be replaced by the manufacturer at his own cost.

Boiler Steel

Grades

1. There shall be three grades of steel for boilers, namely: flange, firebox, and boiler rivet.

I. Manufacture

Process

2. The steel shall be made by the open-hearth process.

II. Chemical Properties and Tests

Chemical Composition

3. The steel shall conform to the following requirements as to chemical composition:

Elements considered.	Flange steel.	Firebox steel.	Boiler rivet steel.
Manganese, per cent.	0.30 to 0.60	0.30 to 0.50	0.30 to 0.50
Phosphorus, max., per cent.:			
Basic	0.04	0.035	0.04
Acid	0.05	0.04	0.04
Sulphur, max., per cent.	0.05	0.04	0.045

Ladle Analyses

4. To determine whether the material conforms to the requirements specified in section 3, an analysis shall be made by the manufacturer from a test ingot taken during the pouring of each melt. A copy of this analysis shall be given to the purchaser or his representative.

Check Analyses

5. A check analysis may be made by the purchaser from a broken tension test specimen representing each plate as rolled, and this analysis shall conform to the requirements specified in section 3.

III. Physical Properties and Tests

Tension Tests

6. The steel shall conform to the following requirements as to tensile properties:

Properties considered.	Flange steel.	Firebox steel.	Boiler rivet steel.
Tensile strength, lb. per sq. in.	55,000—65,000	52,000—62,000	45,000—55,000
Yield point, min., lb. per sq. in.	0.5 tens. str.	0.5 tens. str.	0.5 tens. str.
Elongation in 8 in., min., per cent. ...	1,450,000*	1,450,000*	1,450,000
	tens. str.	tens. str.	tens. str.

Yield Point

7. The yield point shall be determined by the drop of the beam of the testing machine.

Modifications in Elongation

8. (a) For plates over $\frac{3}{4}$ in. in thickness, a deduction of 0.5 from the specified percentage of elongation will be allowed for each increase of $\frac{1}{4}$ in. in thickness above $\frac{3}{4}$ in., to a minimum of 20 per cent.

(b) For plates under $\frac{5}{16}$ in. in thickness, a deduction of 2.5 from the percentage of elongation specified in section 6 shall be made for each decrease of $\frac{1}{16}$ in. in thickness below $\frac{5}{16}$ in.

Bend Tests

9. (a) Cold-bend tests shall be made on the material as rolled.

(b) Quench-bend test specimens, before bending, shall be heated to a light cherry red as seen in the dark (about 1200 deg. F.), and quenched in water the temperature of which is about 80 deg. F.

(c) Specimens for cold-bend and quench-bend tests of flange and firebox steel shall bend through 180 deg. without fracture on the outside of the bent portion, as follows: For material $\frac{3}{4}$ in. and under in thickness, flat on themselves; for material over $\frac{3}{4}$ in. up to $1\frac{1}{2}$ in. in thickness, around a pin the diameter of which is equal to the thickness of the specimen; and for material over $1\frac{1}{2}$ in. in thickness, around a pin the diameter of which is equal to $1\frac{1}{2}$ times the thickness of the specimen.

(d) Specimens for cold-bend and quench-bend tests of boiler rivet steel shall bend cold through 180 deg. flat on themselves without fracture on the outside of the bent portion.

(e) Bend tests may be made by pressure or by blows.

Test Specimens

10. (a) Tension and bend test specimens for plates shall be taken from the finished product, and shall be of the full thickness of material as rolled. Tension test specimens shall be of the form and dimensions shown in Fig. 1. Bend test specimens shall be $1\frac{1}{2}$ in. to $2\frac{1}{2}$ in. wide, and shall have the sheared edges milled or planed.

(b) The tension and bend test specimens for rivet bars shall be of the full-size section of material as rolled.

Number of Tests

11. (a) One tension, one cold-bend, and one quench-bend test shall be made from each plate as rolled.

(b) Two tension, two cold-bend, and two quench-bend tests shall be made for each melt of rivet steel.

(c) If any test specimen develops flaws, or if a tension test specimen breaks outside the middle third of the gauge length, it may be discarded and another specimen substituted therefor.

IV. Permissible Variations in Weight and Gauge

Permissible Variations

12. (a) The thickness or weight of each sheared plate shall conform to the schedule of permissible variations, Manufacturers' Standard practice, appended to these specifications.

(b) The dimensions of rivet bars shall conform to the Manufacturers' Standard practice governing allowable variations in the size of hot-rolled bars, appended to these specifications.

V. Finish

Finish

13. The finished material shall be free from injurious defects and shall have a workmanlike finish.

*See section 8.

VI. Marking

Marking

14. The melt or slab number, name of the manufacturer, grade, and the minimum tensile strength for its grade as specified in section 6 shall be legibly stamped on each plate. The melt or slab number shall be legibly stamped on each test specimen representing that melt or slab.

VII. Inspection and Rejection

Inspection

15. The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the material is being furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

Rejection

16. Material which, subsequent to the above tests at the mills and its acceptance there, develops weak spots, brittleness, cracks or other imperfections, or is found to have injurious defects, may be rejected at the shop, and shall then be replaced by the manufacturer at his own cost.

Manufacturers' Standard Practice

(Adopted 1896)

Permissible Variations in Sheared Plates

The thickness or weight of each sheared plate shall not vary more than the permissible variations given below:

(a) When ordered to weight:

For plates $12\frac{1}{2}$ lb. per sq. ft. or over:

Under 100 in. in width, 2.5 per cent. above or below the specified weight.

100 in. in width and over, 5 per cent. above or below the specified weight.

For plates under $12\frac{1}{2}$ lb. per sq. ft.:

Under 75 in. in width, 2.5 per cent. above or below the specified weight.

75 to 100 in. in width, 5 per cent. above or 3 per cent. below the specified weight.

100 in. in width and over, 10 per cent. above or 3 per cent. below the specified weight.

(b) When ordered to gauge: The thickness of each plate shall not vary more than 0.01 in. under that ordered.

An excess over the nominal weight corresponding to the dimensions on the order shall be allowed for each plate, if not more than that shown in the following table; one cubic inch of rolled steel being assumed to weigh 0.2833 lb.:

TABLE OF ALLOWANCES FOR OVERWEIGHT FOR SHEARED PLATES WHEN ORDERED TO GAUGE

Thickness ordered, in.	Nominal weight, lb. per sq. ft.	Allowable excess (expressed as percentage of nominal weight)							
		For width of plate as follows:							
		50 in.		70 in.		100 in.		115 in.	
		Under 50 in.	Over 50 in.	Under 70 in.	Over 70 in.	Under 100 in.	Over 100 in.	Under 115 in.	Over 115 in.
$\frac{1}{8}$ to $\frac{5}{32}$	3.10 to 6.37	10	15	20	....	....	....	....	....
$\frac{5}{32}$ to $\frac{3}{16}$	6.37 to 7.65	8.5	12.5	17	....	....	....	....	....
$\frac{3}{16}$ to $\frac{1}{4}$	7.65 to 10.20	7	10	15	....	....	....	....	....
$\frac{1}{4}$	10.20	....	....	....	10	14	18	....	....
$\frac{5}{16}$	12.75	....	....	....	8	12	16	....	....
$\frac{3}{8}$	15.30	....	....	....	7	10	13	17	....
$\frac{7}{16}$	17.85	....	....	....	6	8	10	13	....
$\frac{1}{2}$	20.40	....	....	....	5	7	9	12	....
$\frac{9}{16}$	22.95	....	....	....	4.5	6.5	8.5	11	....
$\frac{5}{8}$	25.50	....	....	....	4	6	8	10	....
Over $\frac{5}{8}$	....	....	....	....	3.5	5	6.5	9	....

Allowable Variations in the Weight of Bar Sizes of Angles, Tees, Zees and Channels

(Adopted 1910.)

For bar sizes of angles, tees, zees and channels the following average variations in weight will be permitted for sections of the various dimensions and thicknesses stated, namely:

Dimensions.	Thickness.	Variation in weight over and under.
Any dimension over $1\frac{1}{2}$ in.	Over $\frac{3}{16}$ in.	4 per cent.
All dimensions $1\frac{1}{2}$ in. and less.	Over $\frac{3}{16}$ in.	5 per cent.
Any dimension over $1\frac{1}{2}$ in.	$\frac{3}{16}$ in. and less.	6 per cent.
All dimensions $1\frac{1}{2}$ in. and less.	$\frac{3}{16}$ in. and less.	7 per cent.

NOTE.—A channel is in "bar" size when its greatest dimension is less than 3 in. An angle, tee or zee is in "bar" size when its greatest dimension is less than 3 in.; or when it is 3 in. or more and at the same time the thickness is less than $\frac{3}{4}$ in.

Allowable Variations in the Size of Hot-Rolled Bars

(Adopted 1910.)

ROUNDS, SQUARES, HEXAGONS

	Variation in size.	
	Under.	Over.
Up to and including $\frac{1}{8}$ in.	0.007 in.	0.007 in.
Over $\frac{1}{8}$ in. to and including 1 in.	0.010 in.	0.010 in.
Over 1 in. to and including 2 in.	$\frac{1}{64}$ in.	$\frac{1}{32}$ in.
Over 2 in. to and including 3 in.	$\frac{1}{32}$ in.	$\frac{3}{64}$ in.
Over 3 in. to and including 5 in.	$\frac{1}{32}$ in.	$\frac{3}{32}$ in.
Over 5 in. to and including 8 in.	$\frac{1}{16}$ in.	$\frac{3}{4}$ in.

FLATS

Width of flats.	Variation in thickness, under and over—Thickness of flats.					
	Variation in width.		Over		Over	
	Under.	Over.	3/16 in. and under.	3/16 in. up to $\frac{1}{2}$ in.	$\frac{1}{2}$ in. up to 1 in.	1 in. up to 2 in.
Up to and including 1 in.	$\frac{1}{64}$	$\frac{1}{32}$	0.006	0.008	0.010	
Over 1 in. up to and including 2 in.	$\frac{1}{32}$	$\frac{3}{64}$	0.008	0.012	0.015	$\frac{1}{32}$
Over 2 in. up to and including 4 in.	$\frac{3}{64}$	$\frac{1}{16}$	0.010	0.015	0.020	$\frac{1}{32}$
Over 4 in. up to and including 6 in.	$\frac{1}{16}$	$\frac{3}{32}$	0.010	0.015	0.020	$\frac{1}{32}$

Important Bethlehem Extensions

An Open Hearth Addition Involving a Cost of \$1,000,000

The Bethlehem Steel Company has begun work on an extension to the open hearth department at its Saucon plant, South Bethlehem, Pa. The addition will be 157 ft. wide by 720 ft. long, and will include the erection of six additional open hearth furnaces, each of 75 tons capacity. After these furnaces are completed (ten open hearth furnaces already being in operation), the plant will have a capacity of 75,000 tons of ingots a month. Besides the six new furnaces, considerable additions are involved by the extension in the way of steel buildings, hot metal mixers, the installation of large electric cranes and other appurtenances. The location of the new furnaces is such that a large excavation will be necessary, representing 160,000 cu. yd. of rock and earth, and the contract for this work has already been let to F. H. Clement & Co.

The extension will be in an eastwardly direction, adjoining the present plant, and will include furnaces of the most modern type and construction. All this capacity will be put into Bethlehem and standard open hearth structural steel shapes and open hearth rails, for all of which there has been an increasing demand upon this company. The cost of the above work will represent considerably over \$1,000,000.

The drop forging business of the company has also increased to the extent that it has been found necessary to provide additional buildings and machinery. The extensions to this department will consist of a new warehouse for storing the drop forged material, also a treating and finishing department. The expenditure will be about \$100,000.

Robert S. Rathbun, contractor, has begun work on the addition to the general office building, and work has also been started on the new armor plate office by the Ochs Construction Company.

The large gas holder under construction for the storage of coke oven gas, which is to be used in the various departments of the Bethlehem Steel Company, is nearing completion. It will have a capacity of 1,000,000 cu. ft. The gas is carried from the holder to the Saucon plant in gas mains 36 in. in diameter, the laying of which is about completed.

The handling of materials in large masses is by no means confined to steel plants. The Boston & Montana smelter, at Great Falls, Montana, is now operating a copper converter which will take approximately 50 tons of molten metal. It is of the upright type and will have a weight of approximately 300 tons when full of metal. This converter has a diameter of 20 ft. and is declared to be the largest copper converter in existence.

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Improvement in the Foundry Trade

Evidences have been accumulating in the pig iron market of the development of the second stage in any sustained activity in the steel trade—that which involves expansion in the foundry industry. For more than four years the merchant blast furnaces and the foundries, which have become more and more their dependence as the steel companies have grown self-contained, have been companions in misery. What looked like real improvement came to the furnace companies in the late months of 1909, when the steel trade seemed to be moving to higher ground, but it lacked staying qualities, proving to be only a premature building up of depleted stocks of all forms of iron and steel products. By the spring of 1910 hand-to-mouth buying became the rule again. But at no time in this interval of mild excitement in the steel trade did foundrymen find any occasion to stir themselves.

Two years passed with no change for the better in foundry operations. Taking foundry pig iron statistics as a measure, 1910 was not as good a year as 1909. The total output of foundry and malleable pig iron was 6,103,570 gross tons in 1910 against 5,980,463 tons in the preceding year, but there was a heavy accumulation of stocks in 1910. In 1911 production of all kinds of iron intended for the foundry cupola fell off to 5,081,473 tons, but there was a considerable decrease in stocks at furnace yards. This year there has been a good increase in production, accompanied by a moderate but steady reduction in stocks. Further proof of increased operations has been a scarcity of foundry labor. Unmistakable evidence of the greater demand for molders were strikes in various directions in the past summer and spring, after months of freedom from labor troubles, though in all the interval foundry wage scales were kept on the old prosperity basis.

Active buying by the railroads in the past four months, particularly of cars and locomotives, has put new life into the steel and malleable castings trades. The latter has also felt the beginnings of the impulse given to agricultural works by the prospect of great crops. Buying of machinery for railroad shops has also swelled the total, and castings for mining machinery and electrical equipment, for the power rooms of new buildings and for automobile cylinders, have been in increasing demand. Engine orders for new vessels have been large. More machinery for iron and steel works extensions will be called for this year than in either of the two years preceding, though in general the foundry trade has not yet heard much more than in the past four quiet years from manufacturing extensions. That is a development of which more may be expected in the coming year.

The American Shipbuilders' Handicap

The proposition in the Panama Canal bill to admit free of duty "all materials of foreign production for the construction, repair and equipment of vessels built in the United States" is not hailed with delight by American shipbuilders. They do not regard it as by any means offsetting another provision in the bill which would admit foreign-built ships to American register and thus give such ships the right to engage regularly in our coastwise trade. From time immemorial our tariff acts have contained a clause permitting all materials for ship construction to be admitted in bond, if intended for vessels to be employed in the foreign trade, including the trade between our Atlantic and

Pacific ports, and "upon proof that such materials have been used for such purposes, no duties shall be paid thereon," and such vessels are permitted to engage in the coastwise trade six months in any one year, but this provision has not proved to be sufficient to stimulate the building of vessels in our shipyards for foreign trade. If competition with foreign shipbuilders merely depended on the cost of materials entering into vessel construction, American shipbuilders could give a good account of themselves. On that part of their construction cost they are at present as well off as British or German shipbuilders.

This bill is another illustration of the manner in which the tariff always seems to present itself to non-manufacturers as the great obstacle to lower costs. Other elements of vastly more consequence are ignored or dismissed without consideration. The handicap to ship construction in this country is not the duty on ship materials, but the much higher wages paid to workmen in American shipyards than to those employed in the British and German yards. This difference in wages is so great that it cannot be overcome by the use of better methods or better machinery in this country. As Congress is simply floundering on this shipping question, doing nothing and suggesting nothing of any practical value to the shipbuilding industry or to American maritime interests, it might flounder a bit further and tackle this most pressing factor of high cost and fix a maximum wage rate for workmen in American shipyards, putting it close to the foreign rate. Labor is about the only thing the Government has not attempted to regulate.

Insufficient Postage on Foreign Mail

Few American manufacturers trying to do an export business realize the self-injury inflicted by allowing letters and catalogues bearing insufficient postage to be sent out to foreign correspondents. According to the postal regulations, a letter or catalogue having only a one-cent stamp affixed must be forwarded to destination, but to get the mail the receiver is compelled to pay double the amount of postage due. This is especially true in South American countries. Although the majority of houses endeavoring to do an export business are educated to paying full postage rates on first-class matter, they frequently send abroad catalogues, blue prints and other unsealed packages stamped at domestic rates; and small as the oversight may seem, it has become so prevalent that the Spanish-American importer often looks with suspicion on a business house that is so careless.

A Western firm of machine tool builders, that desired to enter the export field, was recently taught a lesson it will not soon forget. It had been in correspondence with a responsible house in Buenos Aires, with which it was anxious to make a contract for handling its machinery in that territory. Imagine the chagrin of the export manager of the firm on receiving a letter from his South American correspondent, inclosing a bill for 60 cents to cover extra postage on blue prints and advertising matter sent. Accompanying this bill was a very courteous letter, explaining the annoyance experienced by Buenos Aires importers over this small oversight on the part of their American connections and stating that many importers had adopted the rule of not replying to letters on which postage was due, arguing that if a firm was so careless about forwarding its correspondence it would be

equally so in handling any shipments sent. It is needless to add that the manufacturer in question is now very careful to see that such an annoying mistake does not occur again.

While this is seemingly a small matter, it is one highly worthy of consideration, especially for a firm not already well known in the export field.

The Complaint Department

Industrial works having various manufacturing departments, each with a head who is responsible for its product, might profit by the system in vogue in department stores, under which all complaints are received by a special department, which stands between the store and the customer. Experience has shown in mercantile lines that a complaint directly referred to the department from which the purchase was made often arouses a spirit of opposition, with the result of making an enemy out of a customer.

The same situation may arise in a manufacturing plant. A complaint from a customer, if submitted direct to the responsible department, may provoke an attitude of self-defense, an inclination to place the blame on the user, which might react unfavorably. It is found a good plan to have complaints received by one person, who investigates carefully, and carries the matter through either by correspondence or by personal contact with the customer. There will be tact in meeting unjust claims and quick acknowledgment of error if it exists, where the responsibility is centralized in the right sort of man.

In the case of some of the steel companies the adjustment of claims of buyers has developed a branch of the service calling for a combination of talents. The salesman's readiness to see the buyer's viewpoint needs rather to be replaced in the adjuster of complaints by a judicial attitude which while it concedes the possibility of error by the producer does not lean backward in the excess of effort to be fair. Very often the adjuster's familiarity with mill practice will give his opinion weight with both customer and operating department and save the expense and heat of a long-drawn-out dispute.

There are evidences in several directions that more attention is being given of late to efficiency in the department of claims and complaints. Some of the railroads, in belated amends for years of notorious shunting of claims, are exciting comment by courteous and prompt attention to them. It has taken time, but at last it has sunk in, that railroad delinquencies in this regard cost an amount of the public's good will that would have been well worth having in these late years of constant legislative attack.

Commercialism in Trade Schools

A controversy has developed in one of the public trade schools as to how far commercialism should be introduced into the curriculum. One faction maintains that the school should be self-sustaining to as great a degree as possible by the utilization of the labor of the students. The other contention is that the real usefulness of the institution may be seriously crippled as a consequence of too much commercialism.

The question is not a new one. Engineering schools have had to contend with it, and have reduced the problem to what may be termed a compromise position. A certain amount of commercialism is beneficial. In train-

ing a boy as a mechanic, for example, his environment should be one of usefulness. The knowledge that he is making something which is to be sold for practical everyday use produces far better results than if he fashions something the only purpose of which is to develop and test his skill. He should be made to feel the impulse of a business establishment, with its methods of manufacture planned to reduce cost to a minimum in securing a given quality of product. The practical side of the work, in the broad sense of the term, should be made conspicuous.

On the other hand, the student of the trade school should also be well trained as to theory. While his position is analogous to that of the apprentice in a manufacturing establishment, his education should go beyond that point. Given a certain objective in a trade school, it should not be sacrificed to save the public funds any more than that of any other public school. If a lot of machines is to be built by the school for sale in the market the work entailed would comprise an exceedingly good training for the boys in machine shop work, but they should also participate in the designing of the machine, and should be taught something of the principles involved in computing the costs, of the routing of the work, of the procuring of efficient manufacturing methods, and so on. It would be a mistake to work them with the one end in view of making the cost of the lot of machines as low as possible by concentrating their entire efforts to that end.

The danger is similar to that which characterizes the apprentice system in some of our shops. The boys are not given the all-round training as machinists which they are entitled to under the terms of their indentures, because superintendents and foremen are after the highest possible record of production and utilize the boys to that end. The trade school is established for the boys; they are not there to make money for the school except so far as the making of money assists in their education.

The half time school escapes the problem of commercialism. In the weeks during which the boy is at school he gets the theory together with regular school work. The weeks spent in the shops are in a strictly commercial atmosphere, under wise direction.

The Underwood Metal Schedule Dead

The Underwood bill proposed as a substitute for the metal schedule in the existing tariff act, which has been before Congress since January 22, received its quietus August 16. It was vetoed by the President August 14. In his veto message to the House of Representatives on that day, Mr. Taft said, in part:

The Ways and Means Committee avowed that the principle of protection had not been considered, but that in framing the present revision the committee had "adopted the general principle of reducing all duties to a revenue basis so far as practicable, except in those cases where more cogent considerations than those relating to the fiscal policy of the Government dictated the transfer of given items to the free list." This makes a clear-cut issue between the protective policy and that of a tariff for revenue only, and without fuller information, therefore, I am obliged to treat this bill as a revenue bill, and one in which the consideration of preserving the industry by maintaining a tariff necessary to do so had little weight. There is nothing to show me that the duties provided will equal the difference in the cost of production here and abroad in the great line of industries, and that the wages of the workmen will not be reduced by a measure which avowedly discards entirely the principle of fair protection. It should be noted that the labor employed in the secondary industries, which have had so little consideration in this bill, is in a large measure high-grade skilled labor commanding a high level of wages.

Commenting on the fact that all machine tools were put on the free list by the bill, the President said the term

"machine tools" was of such wide application that its scope should be clearly defined. If free entry were made of such tools, the same privilege should be secured for American tools abroad. The message concludes:

A bill for a complete revision of this schedule was presented to me a year ago. Many increases and decreases of rates are now made from those named in the former measure. The changes are not explained, and indicate the hasty method pursued in the preparation of both. Is it not fair to ask, either on the basis of protection, or revenue, which was right? On the whole, therefore, I am not willing to approve of legislation of this kind, which vitally affects not only millions of workmen and the families dependent upon them, but places on the free list millions of dollars' worth of stocks of goods in the hands of storekeepers and distributors generally, without first providing for a careful and disinterested inquiry into the conditions of the whole industry. From the outset of my Administration I have urged a revision of the tariff based on non-partisan study of the facts.

After the veto had been read, the House passed the bill over the veto by a vote of 173 to 83. The bill was then sent to the Senate and on August 16 a vote was taken which sustained the veto by 39 to 32. This disposes of the measure effectually.

High Prices in England

Those who have the impression that the high cost of living in this country is due to influences of a purely domestic character from which other countries are free will find food for thought in an article on rising prices in England in the London Economist of August 3. An abstract of this article is herewith presented:

Prices are advancing at an accelerated rate. Such, at all events, is the conclusion suggested by a comparison of our index number at the end of July with the figures for the end of May and June. Our usual analysis by groups of commodities from the end of last year is as follows:

Date.	Cereals and meat.	Other food products (tea, sugar, etc.).	Textiles.	Minerals.	Miscellaneous (rubber, timber, oils, etc.).	Total.	Percentage of increase.
Basis (average 1901-5)	500	300	500	400	500	2200	..
End Dec., 1911..	600	407	539½	460	580½	2586	17
" Jan., 1912..	607½	405	561	468½	571	2613	18½
" Feb., " ..	619	411	573	493	571	2667	21
" Mar., " ..	618½	400	578	608½	586	2791	27
" April, " ..	625½	385½	581	512½	588½	2693	22½
" May, " ..	633	379	570	493½	611½	2687	22
" June, " ..	642½	373½	579½	501½	608	2705	23
" July, " ..	645	384	605½	512½	599	2746	25

It will be seen that the fall in the general level of prices which followed the coal strike (owing mainly to the drop in coal) was replaced in June by a rise of 18 points upon the level prevailing at the end of May. The figure for July, however, is higher by 41 points than the figure for June, and is but a short distance below the high-water mark reached during the coal strike. The decline in the value of coal has now stopped for the time being, and there has even been a hardening tendency in some varieties during the last month. The firmness of prices is largely owing to the small stocks and the growth of requirements at home and abroad. The busy state of our principal manufacturing industries, including the iron and steel trades, accounts for an enormous consumption; the activity of shipping demands support from immense quantities of bunker coal; and increased exports of coal to foreign countries are required to fill up arrears and to provide for the demands of booming trade. These are all factors which have to be taken into consideration. The iron and steel industries in England and abroad are working at high pressure, and prices are rising, while the decline of stocks, in this country, at any rate, has not yet been checked.

If we look at the general index number, we see that the level of prices has risen about 25 per cent. above the average level of the years 1901-5. The figure at this time last year was 2493, or 13½ per cent. above the average of 1901-5, so that the rise in the last year has been only a little less than in all the previous years. This suggests that the trade "boom," or rather that an expansion of credit accompanying the "boom," is mainly responsible for the

present rapid increase of prices. How near we are to the summit of the "boom," and how soon we must look for a contraction of credit, it is, of course, impossible to predict, but in view of the present conditions bankers, merchants and manufacturers should be cautious.

The New Mastodon Iron Mine

The Largest Menominee Range Ore Body Since the Opening of the Chapin—New Crystal Falls Properties

MARQUETTE, MICH., August 19, 1912.—An important producer will be added to the list of mines in the Crystal Falls district by the development of the Carpenter property by M. A. Hanna & Co. of Cleveland. The tract has been thoroughly drilled and has been proved to contain a large and valuable ore body. It comprises 40 acres in Section 31, 43-32, two miles southwest of Crystal Falls and between the Tobin and Dunn mines of Corrigan, McKinney & Co. Both the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul railroads are preparing to extend tracks to the property. Operations are in charge of Ira Rowe, district superintendent. The Carpenter will be on the shipping list next season. M. A. Hanna & Co. have been opening the Ravenna property the past year, and about 25,000 tons will go forward this summer. The Ravenna is west of the Bristol mine and 1½ miles northwest of Crystal Falls. It has a large deposit of ore and during the winter it will be given a plant of machinery commensurate with its importance.

The greatest mine in the Crystal Falls field, once it is opened, will be the New Mastodon property of the Nevada Land Company, which is controlled by E. J. Longyear and associates. The tract is to be leased to one of the large mining companies and it is expected that development work will start this fall. The New Mastodon is in Section 13, 42-33, five miles southwest of Crystal Falls and two miles south of the Dunn mine. Its ore body is claimed to be the largest discovered on the Menominee range since the opening of the big Chapin mine at Iron Mountain, surpassing even that at Pickands, Mather & Co.'s Caspian mine in the Iron River country. The new discovery is in the same quarter section in which the old Mastodon property was opened many years ago.

Another property scheduled to join the shipping ranks of the Crystal Falls district next year is the Warner tract of Pickands, Mather & Co. of Cleveland. This exploration is in Section 9, 44-33, 11 miles northwest of Crystal Falls and between the Michigan and Gibson mines, it adjoining the latter on the north. The showing is such that the Chicago, Milwaukee & St. Paul Railroad will be extended to the location and additional equipment is to be installed.

The lease of the Hilltop mine at Crystal Falls has been surrendered by the United States Steel Corporation and the property has reverted to the Roberts Ore Company, of which C. T. Roberts of Crystal Falls is the head. The action of the Steel Corporation was unexpected. The Hilltop was drilled last summer and considerable ore was found.

A new shipper in the Iron River district of the Menominee range this season will be the Cortland mine of the Wickwire Steel Company of Buffalo. A good-sized stockpile has been accumulated. The Chicago & Northwestern is extending a spur line to the mine.

In the village of Commonwealth, in the Wisconsin portion of the Menominee range, the Florence Iron Company is sinking a shaft at its Ernst property, so named in honor of the late Ernst Thallman of New York, an official of the corporation. A plant of machinery has been installed. The shaft will be put down to a depth of 300 feet, at which point the ground will be tested laterally.

Increasing Negaunee District Operations

Illustrative of the increased demand for ore, the Republic Iron & Steel Company is again at work at the Hartford mine at Negaunee, Marquette range. The property had been closed for months. By winter it is expected that more than 200 men will be on the payroll. The shaft, now bottomed at nearly 1000 feet, will be put to the 1300-foot point. The resumption of mining will extend to the Cambria, also closed for nearly two years.

Mining activity in the Negaunee field is more pro-

nounced than in various other districts of the old ranges. The mines of the Breitung interests are shipping briskly, as is the Queen group of the Steel Corporation. The Jones & Laughlin Steel Company's Rolling Mill property is forwarding a good-sized tonnage daily. The Cleveland-Cliffs Iron Company is taking on additional men at the Maas mine, which had been idle for more than a year, pending costly and extensive repairs, and operations at the same company's Negaunee mine are being enlarged. The development of the Lucky Star mine, in which work the Breitung estate and the Cleveland-Cliffs interests are associated, is in progress.

At the American property of M. A. Hanna & Co., west of Ishpeming, the Denver Engineering Works Company is engaged in erecting a concentrating plant at which will be treated the low grade ores found in close association with the higher grade material for which the American is noted.

American Armor Plate for Greece

The Bethlehem Steel Company's Large Contract—Important Work the Same Company Has on Hand for Other Governments

The Bethlehem Steel Company has just been officially notified that it has been awarded the contract for the armor plate, armament and ammunition for a battleship for Greece. The award is regarded as a strong testimonial to the excellence of American armor plate and ordnance, since it was taken in competition with English, German and French manufacturers of this material. The ship is of 14,000 tons displacement, and the hull and machinery will be built in the yards of the Vulcan Shipbuilding Company, Stettin, Germany. The material which the Bethlehem Company will furnish will be forwarded to the Vulcan yards for installation on the ship.

The Bethlehem company's contract covers upward of 3000 tons of armor plate, and the battery consists of six 14-in. guns, eight 6-in. guns, eight 3-in. guns, and twenty-six guns of smaller calibers than 3 in. The value of the work which will be executed at South Bethlehem is above \$3,000,000. All the material will have to be completed in the early months of 1914. It is to be furnished in accordance with the standards of the United States Navy. The Bethlehem company has already been notified that the officer of the Grecian navy who is to be in charge of the inspection work will arrive at its plant by the end of this month.

The Bethlehem Steel Company is rapidly increasing its foreign business, having at present in an advanced stage of completion a large contract for the armor, armament and ammunition for two dreadnaughts of 26,000 tons displacement each, for the Argentine Republic. In addition to this, as announced some days ago, the company expects to supply the Argentine Government with a number of spare guns, intended for these vessels, as well as additional ammunition. It also has well along a contract for armor plate for the Italian Government. Recently, it will be recalled, the State Department at Washington published the statement that the Bethlehem company would be awarded the contract for a number of larger caliber guns intended for the coast defence system of Chile. While no official notification of this award has come to South Bethlehem from the Chilean Government, there is every reason to believe that such information will be forthcoming in the near future. In addition to all of the above, the company has excellent prospects of doing business with other foreign Governments.

The one thing more than any other which, in the opinion of the Bethlehem Steel Company, has contributed to the success it has met in its foreign business is the untiring energy displayed by the State Department of the United States in the interest of American manufacturers.

The Machine Tool Builders' Convention

The annual convention of the National Machine Tool Builders' Association will be held at the Hotel Astor, New York City, October 16, 17 and 18, the time and place for holding the meeting having been decided upon by the Executive Committee during the past week. The programme will be prepared later.

The Iron and Metal Markets

Large Pig Iron Buying for 1913

A 60,000-Ton Sale of Southern Pipe Iron

Further Rail Inquiries for Next Year—Car Works Requirements Still Heavy

Nearby rather than farther future needs of buyers are still the dominating factor in the finished steel situation. In pig iron, on the other hand, current buying is largely for the first quarter of 1913.

It should not be overlooked, in the spectacular way in which premiums for quick delivery are reported in some quarters, and emphasis put on the pressure upon the mills, that deliveries to consumers are very heavy, and that by far the greater number of them are getting material as needed. There is definite effort by some important producers to eliminate premiums and to keep the situation within bounds. Thus far there are no indications that this cannot be done.

Contract business for forward delivery is rather more of a factor than in midsummer, and much of it is for car builders. A Canadian car company has placed 60,000 tons of plates and shapes with the Steel Corporation in the past week for the 6000 cars recently bought by the Canadian Pacific. Deliveries run to May, 1913. Western car works have been buyers of a round tonnage also, and further reservations have been made to cover cars under inquiry. The B. & O. and the Pennsylvania Railroad are expected to buy a large number of cars.

Buyers are not putting up prices on each other by attempts to anticipate distant future needs; the advances are coming from the other side and at the recent rate will produce a wide gap between the low priced orders now going through the mills and the new contracts for 1913. Herein is the danger of ultimate restriction of consumption. Yet some steel companies will sell at present prices for the first quarter of next year to manufacturing consumers.

Besides the 220,000 tons of rail orders already reported for next year, inquiries for more than that amount are pending at Chicago, including 80,000 tons for the Chicago & Northwestern, a large tonnage for the St. Paul, 15,000 tons for the Great Northern and 75,000 tons for the Santa Fe. The Harriman lines are in the market for 24,000 tons for this year, which would be their third purchase for 1912. In the export trade there is an order for 12,000 tons for Argentina which will be filled at Pittsburgh.

Some producers have advanced prices for bars and for plates and structural shapes \$1 a ton, or to 1.35c. and 1.40c., Pittsburgh, respectively. The leading interest is still selling bars at 1.30c. and plates and shapes at 1.35c. Eastern mills have advanced contract plates to 1.50c. for sheared and 1.55c. for universal, and a 5000-ton sale is reported on this basis. Blue annealed sheets have been put up \$1 a ton. Rivets are up \$3 and nuts and bolts are likely to advance again this week.

Structural work is being freely placed at higher prices—in some cases on a 1.40c. Pittsburgh basis for steel—and many small jobs are going to fabricators at further advances where early deliveries can be made. From low point fabricated steel has now come up \$8

on large business. Contracts just announced at old bids include 14,000 tons for the Biltmore hotel and 10,000 tons for the Western Union building, New York, 5500 tons for the Curtis building addition and 3500 tons for the Fairmount hotel at Philadelphia. In the East railroads have placed about 12,000 tons for bridges and the largest Western bridge contract is 5000 tons for the St. Paul.

Improvement in the wire trade is still in part a matter of prediction, based on small stocks, and the further advance in prices recently hinted at may come because wire products have long been out of line.

In billets and sheet bars the tendency is still to advance. An Eastern sale of 10,000 tons of billets has been made to the Steel Corporation. At Pittsburgh Bessemer billets have sold at \$22.50 and open hearth at \$23, with sheet bars 50 cents to \$1 above these prices.

Buying of foundry pig iron for 1913 is going on in a large way, but is much more active at some centers than at others. Thus far large interests have done most of it. Buffalo reports a 75,000-ton week following one of 75,000 to 100,000 tons. Other markets have done more than in the previous week. Prices on Northern iron have advanced irregularly, but the average is about 25 cents for the week.

Southern iron is firmer at \$12, Birmingham, for No. 2, for this year, and \$12.50 is the usual basis for first quarter of 1913. A 60,000-ton sale was made to a cast iron pipe company, deliveries mostly in the first quarter of 1913, on the \$12.50 basis for No. 2. The pipe foundries are figuring on a large amount of municipal business.

Steel-making iron is quiet at Pittsburgh, but in eastern Pennsylvania two sales of 10,000 tons of basic were made for first quarter at \$16.15 and \$16.25 delivered, while a 5000-ton sale for this year is reported at a shade below \$16 delivered. Sellers now ask \$16.50 for 1913 iron and several inquiries are pending.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 21, 1912.	Aug. 14, 1912.	July 24, 1912.	Aug. 23, 1911.
Pig Iron, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	\$16.00	\$15.75	\$15.75	\$15.00
Foundry No. 2, Valley furnace	14.00	14.00	13.50	13.50
Foundry No. 2, Southern, Cincinnati	15.00	15.00	14.75	13.50
Foundry No. 2, Birmingham, Ala.	11.75	11.75	11.50	10.25
Foundry No. 2, at furnace, Chicago*	15.50	15.50	15.00	14.50
Basic, delivered, eastern Pa.	16.00	15.75	15.50	14.75
Basic, Valley furnace	14.00	14.00	13.50	13.00
Bessemer, Pittsburgh	15.40	15.40	15.15	15.90
Malleable Bessemer, Chicago	15.50	15.50	14.50	14.50
Gray forge, Pittsburgh	14.40	14.15	13.90	13.90
Lake Superior charcoal, Chicago	16.25	16.25	16.25	16.50
Billets, etc., Per Gross Ton:				
Bessemer billets, Pittsburgh	22.50	22.00	21.50	21.00
Open Hearth Billets, Pittsburgh	23.00	22.50	21.50	21.00
Forging billets, Pittsburgh	29.00	29.00	28.00	26.00
Open hearth billets, Philadelphia	25.40	24.40	24.40	23.40
Wire rods, Pittsburgh	26.00	25.50	25.00	27.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	16.00	16.00	16.00	14.00
Iron rails, Philadelphia	16.50	16.50	16.50	17.50
Car wheels, Chicago	14.00	13.50	13.50	13.00
Car wheels, Philadelphia	14.00	14.00	14.00	13.00
Heavy steel scrap, Pittsburgh	13.75	13.50	13.25	13.25
Heavy steel scrap, Chicago	12.00	12.00	11.50	11.00
Heavy steel scrap, Philadelphia	14.00	13.75	13.50	13.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Finished Iron and Steel,

Aug. 21, Aug. 14, July 24, Aug. 23,

Per Pound to Largest Buyers:	1912.	1912.	1912.	1911.
Cents.	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill...	1.25	1.25	1.25	1.25
Iron bars, Philadelphia.....	1.37½	1.37½	1.32½	1.27½
Iron bars, Pittsburgh.....	1.40	1.40	1.35	1.25
Iron bars, Chicago.....	1.40	1.40	1.35	1.20
Steel bars, Pittsburgh.....	1.30	1.30	1.25	1.20
Steel bars, tidewater, New York	1.46	1.46	1.41	1.36
Tank plates, Pittsburgh.....	1.35	1.35	1.30	1.35
Tank plates, tidewater, New York	1.51	1.51	1.46	1.51
Beams, Pittsburgh.....	1.35	1.35	1.30	1.35
Beams, tidewater, New York....	1.51	1.51	1.46	1.51
Angles, Pittsburgh.....	1.35	1.35	1.30	1.35
Angles, tidewater, New York....	1.51	1.51	1.46	1.51
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.20
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.30	1.30

Sheets, Nails and Wire,

Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.05	2.00	2.00	2.00
Wire nails, Pittsburgh.....	1.65	1.65	1.65	1.70
Cut nails, Pittsburgh.....	1.60	1.60	1.55	1.60
Fence wire, ann'd, 0 to 9, Pgh.	1.45	1.45	1.45	1.50
Barb wire, galv., Pittsburgh..	1.95	1.95	1.95	2.00

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt shipment	\$2.25	\$2.15	\$2.20	\$1.50
Furnace coke, future delivery..	2.25	2.25	2.25	1.60
Foundry coke, prompt shipment	2.40	2.40	2.40	1.85
Foundry coke, future delivery..	2.50	2.50	2.40	2.10

Metals, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	17.65	17.75	17.62½	12.75
Electrolytic copper, New York..	17.60	17.62½	17.62½	12.50
Spelter, St. Louis.....	6.95	7.05	7.20	5.95
Spelter, New York.....	7.10	7.20	7.35	6.10
Lead, St. Louis.....	4.40	4.35	4.60	4.42½
Lead, New York.....	4.50	4.50	4.70	4.50
Tin, New York.....	46.20	45.87½	43.75	45.00
Antimony, Hallett, New York..	7.87½	7.87½	7.87½	7.75
Tin plate, 100-lb. box, New York	\$3.74	\$3.74	\$3.74	\$3.94

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6½ in. up to 100 in. wide, 1.35c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft., down to the weight of 3-16 in., take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in.....	.10
Gauges under 3-16 in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including straight taper plates) 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inc.	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inc.	.50
Cutting to lengths or diameters under 1 ft.....	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Rods and Wire.—Bessemer, open-hearth and chain rods, \$6. Fence wire, Nos. 0 to 9, per 100 lb., terms, 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, \$1.45; galvanized, \$1.75. Galvanized barb wire, to jobbers, \$1.95; painted, \$1.65. Wire nails to jobbers, \$1.65.

The following table gives the price to retail merchants on wire in less than carloads, including the extras Nos. 10 to 16, which are added to the base price:

Fence Wire per 100 lb.	0 to 9	10	11	12	12½	13	14	15	16
Annealed	\$1.60	\$1.65	\$1.70	\$1.75	\$1.85	\$1.95	\$2.05	\$2.15	\$2.25
Galvanized	1.90	1.95	2.00	2.05	2.15	2.25	2.35	2.45	2.55

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in.

and over, and zeeks, 3 in. and over, 1.35c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.....	1.40 to 1.45
H-beams over 18 in.....	1.40 to 1.45
Angles over 6 in.....	1.40 to 1.45
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909.....	1.40 to 1.45
Tees, 3 in. and up.....	1.40 to 1.45
Angles, channels and tees, under 3 in. plus full extras as per steel bar card Sept. 1, 1909	1.40 to 1.45
Deck beams and bulb angles.....	1.65 to 1.70
Hand rail tees.....	2.10 to 2.25
Checkered, trough and corrugated floor plates.	2.25 to 2.50

Extras for Cutting to Length.

	Cents per lb.
Under 3 ft., to 3 ft. inclusive.....	.25
Under 2 ft., to 1 ft. inclusive.....	.50
Under 1 ft.....	1.55
No charge for cutting to lengths 3 ft. and over.	

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows:

Blue Annealed Sheets	Cents per lb.
Nos. 3 to 8.....	1.45
Nos. 9 and 10.....	1.50
Nos. 11 and 12.....	1.55
Nos. 13 and 14.....	1.60
Nos. 15 and 16.....	1.70

Box Annealed Sheets, Cold Rolled	Cents per lb.
Nos. 10 to 12.....	1.70 to 1.75
Nos. 13 and 14.....	1.75 to 1.80
Nos. 15 and 16.....	1.80 to 1.85
Nos. 17 to 21.....	1.85 to 1.90
Nos. 22, 23 and 24.....	1.90 to 1.95
Nos. 25 and 26.....	1.95 to 2.00
No. 27.....	2.00 to 2.05
No. 28.....	2.05 to 2.10
No. 29.....	2.10 to 2.15
No. 30.....	2.20 to 2.25

Galvanized Sheets of Black Sheet Gauge	Cents per lb.
Nos. 10 and 11.....	2.15 to 2.20
Nos. 12, 13 and 14.....	2.25 to 2.30
Nos. 15 and 16.....	2.40 to 2.45
Nos. 17 to 21.....	2.55 to 2.60
Nos. 22, 23 and 24.....	2.65 to 2.70
Nos. 25 and 26.....	2.85 to 2.90
No. 27.....	3.00 to 3.05
No. 28.....	3.15 to 3.20
No. 29.....	3.25 to 3.30
No. 30.....	3.45 to 3.50

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following:

Corrugated Roofing Sheets by Weight.

Effective April 18, 1912, the rates for painted and formed roofing sheets, per 100 lb., as announced by most of the leading sheet manufacturers, are based on the following extras for painting and forming over prices for corresponding gauges in black and galvanized sheets:

Painting.	29	25 to 28	19 to 24	12 to 18
Regular or oiling.....	0.15	0.10	0.10	0.05
Graphite, regular.....	0.25	0.15	0.10	0.10
Forming.				
2, 2½, 3 and 5 in. corrugated	0.05	0.05	0.05	0.05
2 V-crimped, without sticks..	0.05	0.05	0.05	0.05
¾ to 1½ in. corrugated.....	0.10	0.10	0.10	0.10
3 V-crimped, without sticks.....	0.10	0.10	0.10	0.10
Pressed standard seam, with cleats.....	0.15	0.15	0.15	0.15
Plain roll roofing, with or without cleats.....	0.15	0.15	0.15	0.15
Plain brick siding.....	0.20	0.20	0.20	0.20
3-15-in. crimped.....	0.20	0.20	0.20	0.20
Weatherboard siding.....	0.25	0.25	0.25	0.25
Beaded ceiling.....	0.25	0.25	0.25	0.25
Rock, face brick and stone siding.....	0.25	0.25	0.25	0.25
Roll and cap roofing, with caps and cleats.....	0.25	0.25	0.25	0.25
Roofing valley, 12 in. and wider.....	0.25	0.25	0.25	0.25
Ridge roll and flashing (plain or corrugated).....	0.65	0.65	0.65	0.65

Boiler Tubes.—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.	Standard Charcoal Iron.
1½ to 2½ in.....	63
2½ in.....	65½
2½ to 3½ in.....	70½
3½ to 4 in.....	73
5 to 6 in.....	65½
7 to 13 in.....	63
1½ in.....	46
1½ to 2½ in.....	48
2½ in.....	53
2½ to 3½ in.....	55½
3½ to 5 in.....	58
Locomotive and steamship special grades bring higher prices.	

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2½ in. and larger, over 32 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Wrought Pipe.—The following are the jobbers' carload discounts (card weight) on the Pittsburgh basing card on steel pipe, in effect from July 24, 1912; iron pipe from August 12, 1912, one point greater being allowed on merchant weight:

	Steel		Iron	
	Black	Galv.	Black	Galv.
1/2 and 3/4 in.	72	52	..	..
3/4 in.	73	63	67	51
1 in.	76	66	70	57
3/4 to 1 1/2 in.	79	71	73	62
2 to 3 in.	80	73	74	63

Lap Weld.				
1 1/2 in. ....	..	..	68	57
2 in.	77	70	70	61
2 1/2 to 4 in.	79	72	72	64
4 1/2 to 6 in.	78	70	71	63
7 to 12 in.	76	66	69	59
13 to 15 in.	53	..	45	..

Plugged and Reamed.				
1 to 1 1/2 in., butt weld.	77	69	71	60
2 to 3 in., butt weld.	78	71	72	61
2 in., lap weld.	75	68	68	59
2 1/2 to 4 in., lap weld.	77	70	70	62

Butt Weld, extra strong, plain ends, card weight.				
3/8, 1/2, 3/4 in.	68	58	63	53
1 in.	73	67	68	61
3/4 to 1 1/2 in.	77	71	72	63
2 to 3 in.	78	72	73	64

Lap Weld, extra strong, plain ends, card weight.				
1 1/2 in. ....	..	..	62	54
2 in.	74	68	69	61
2 1/2 to 4 in.	76	70	71	64
4 1/2 to 6 in.	75	69	70	63
7 to 8 in.	68	58	63	53
9 to 12 in.	63	53	58	48

Butt Weld, double extra strong, plain ends, card weight.				
1/2 in.	63	57	58	50
3/4 to 1 1/2 in.	66	60	61	53
2 to 2 1/2 in.	68	62	63	55

Lap Weld, double extra strong, plain ends, card weight.				
2 in.	64	58	59	50
2 1/2 to 4 in.	66	60	61	55
4 1/2 to 6 in.	65	59	60	54
7 to 8 in.	58	48	53	43

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Pittsburgh

PITTSBURGH, PA., August 21, 1912.

Mills are simply being swamped with specifications. It is no longer a question of trying to get more business, the chief concern of the steel makers being to get out every ton of material they possibly can and thus do their best to try to satisfy customers on deliveries. The changes in prices during the week were an advance of \$3 a ton on rivets and \$1 a ton on blue annealed sheets, while one leading local maker of plates and shapes is now quoting 1.40c., minimum. The new demand for pig iron is quiet, as consumers are pretty well covered, but billets and sheet bars are very active and the local market is higher. On finished iron and steel the new demand continues heavy. The wire trade, which seemed to drag for a time, has recently picked up and prices are firm. The scrap market this week is stronger. Signs of a serious car shortage have come, and the mills are rushing shipments as fast as possible, appreciating that the situation will get worse when the Western crops begin to move. There are some signs of a runaway market, but the leading makers of steel are doing all they can to discourage this, and in a number of cases have refused premiums for quick deliveries, feeling that it would be unfair to rob their regular customers of material rightfully due them for the sake of a little extra profit. The situation in steel has not been as active as at present since the early part of 1907, and it promises to continue this way for some months to come. Little or no attention is being paid to the political situation, which is very unusual in a Presidential election year.

Pig Iron.—The local demand for pig iron has quieted down to some extent, this being largely due to the fact that consumers are pretty well covered over the remainder of this year. Corrigan, McKinney & Co. have started up their Josephine furnace at Josephine, Pa., and are reported to have made a large contract for basic iron with a local consumer, but this is not confirmed. Rebecca furnace at Kittanning, Pa., was also started last week on foundry iron, but will soon go on basic, and Alice furnace of the Valley Mold & Iron Company at Sharpsville, Pa., may start in the near future. Sales of 2000 to 3000 tons of No. 2 foundry iron have been

made in the past week for remainder of the year delivery at \$14, Valley furnace. We also note a sale of 3000 to 4000 tons of forge iron for delivery over the remainder of the year at about \$13.60, Valley furnace. The market is very firm and higher prices in the near future are predicted on basic and foundry iron. We quote: Standard Bessemer iron, \$14.50; malleable Bessemer, \$13.75 to \$14; No. 2 foundry, \$14; basic, \$14, and gray forge, \$13.50 to \$13.75, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel Billets and Sheet Bars.—The Carnegie Steel Company is still very short of steel and the Steel Corporation has bought recently 10,000 tons of open hearth billets, part of which is for delivery at Pencoyd, Pa. Some fairly large inquiries are in the market for sheet bars and billets, and several sales of round tonnages of Bessemer billets have been made in the past week at \$22.50 and of open hearth billets at \$23 or higher, at makers' mill, Pittsburgh. Steel makers that are able to promise fairly prompt deliveries on billets or sheet bars can readily get premiums of \$1 to \$2 a ton over regular prices. We have advanced prices in the local market on both Bessemer and open hearth billets and now quote: Bessemer billets, \$22.50 to \$23; Bessemer sheet bars, \$23 to \$23.50; open hearth billets, \$23 to \$23.50, and open hearth sheet bars, \$23 to \$24, f.o.b. mill, Pittsburgh or Youngstown. Axle billets are very firm at \$27 to \$28. Forging billets are higher, and we quote such billets for general purposes at \$29 to \$30, f.o.b. cars at mill, Pittsburgh. Sales of 2500 to 3000 tons of Bessemer sheet bars are reported at \$23.50, Youngstown.

Ferroalloys.—There is a good deal of new inquiry for ferromanganese and ferrosilicon in carload and larger lots for prompt delivery, consumers who covered some time ago by contracts finding that their consumption is larger than expected, and they are compelled to come in the market for additional quantities. There is also a fair amount of new inquiry on both ferrosilicon and ferromanganese for next year. We note sales of five or six cars of ferromanganese for prompt shipment at \$52, Baltimore, and sales of three carloads, or about 100 tons, of ferrosilicon, for prompt shipment, at the full price of \$72.50, Pittsburgh. We quote 80 per cent. English ferromanganese for prompt delivery at \$52 and for forward delivery at \$51, Baltimore, the freight rate to the Pittsburgh district being \$1.95 a ton. We quote 50 per cent. ferrosilicon in lots up to 100 tons at \$72.50; over 100 tons to 600 tons, \$71.50, and over 600 tons, \$70.50, Pittsburgh. The lower grades are ruling at \$20 for 10 per cent., \$21 for 11 per cent. and \$22 for 12 per cent., f.o.b. cars at Ashland, Ky., or Jackson, Ohio. On ferrotitanium we quote 8c. per lb. for carload lots, 10c. per lb. in 2000-lb. lots and over, and 12 1/2c. per lb. in lots up to 2000 lb.

Wire Rods.—There is a fair amount of new inquiry and makers report that consumers are specifying quite freely against contracts. One of the larger local makers states that it has practically no rods to spare for the open market. Prices are higher and we now quote Bessemer, open hearth and chain rods at \$26, Pittsburgh.

Muck Bar.—There is a good deal of inquiry for muck bar from the pipe mills, and some of the bar iron mills are trying to buy in the open market, but there is very little being offered. A sale of 1000 tons has been made to a local consumer at about \$30.50, delivered. We quote best grades, made from all pig iron, at \$30.50, delivered buyer's mill, in the Pittsburgh district.

Skelp.—Local skelp makers report an active demand, with enough business on their books to carry them over the next two or three months. A decided scarcity in supply of sheared iron skelp is reported, prices on which are very firm. A sale of 2000 tons of sheared iron plates is noted at about 1.80c., delivered at buyer's mill, Pittsburgh. We quote grooved steel skelp at 1.25c. to 1.30c.; sheared steel skelp at 1.30c. to 1.35c.; grooved iron skelp, 1.70c. to 1.75c., and sheared iron skelp, 1.75c. to 1.80c., delivered at buyer's mill in the Pittsburgh district.

Steel Rails.—A good many repeat orders for standard sections are being placed, which, while small in themselves, aggregate a considerable tonnage. The Edgar Thomson mills of the Carnegie Steel Company now have more tonnage ahead of them than for a very long time. The Ohio works of the Carnegie Steel Company at Youngstown, Ohio, is still running on open hearth rails, mostly for the export trade, and will likely continue so for several months. There is an active demand for light rails, this company having received new orders and specifications in the past week for about 4500 tons. It has also recently received an order for

15,000 steel ties for the Pittsburgh Railways Company. We quote splice bars at 1.50c. per lb., and rails as follows: Standard sections, 1.25c. per lb.; 8 and 10-lb., 1.34c.; 12 and 14-lb., 1.29c.; 16 and 20-lb., 1.24c.; 25, 30, 35, 40 and 45-lb., 1.19c., in carload lots, f.o.b. Pittsburgh.

Car Wheels and Axles.—Makers report that the new demand for car wheels for freight and passenger service is heavy. The Carnegie Steel Company has recently furnished Schoen steel wheels for a large number of cars built by the Cambria Steel Company for the Baltimore & Ohio Railroad, and also a large number of such wheels for freight car service for cars built by the Berwind-White Coal Company at Windber, Pa. We quote 33-in. solid rolled steel wheels for freight service at \$14.50 to \$15 per wheel, and 36-in. solid rolled steel wheels for passenger train service at \$18 to \$18.50 per wheel. The new demand for axles is also very heavy and we quote forged steel freight car axles at 1.50c. to 1.55c. base, per lb.

Structural Material.—New inquiries are very active, and most of the structural fabricating concerns are filled up for some time and are either not bidding on new work or else are naming prohibitive prices. The Jones & Laughlin Steel Company announces that its minimum price on shapes is 1.40c. and that it will not book any new business under that figure. The Fort Pitt Bridge Works has taken 1400 tons of steel for new buildings for the Wheeling Sheet & Tin Plate Company, Wheeling, W. Va.; American Bridge Company, 2000 tons for a new building for the Atlanta Realty Company, Atlanta, Ga.; McClintic-Marshall Construction Company, 700 tons for a steel pier at San Francisco; Des Moines Bridge & Iron Works, 125 tons for a power house at Salt Lake City. The Pittsburgh & Lake Erie Railroad has placed 400 tons for a round-house at Dickerson Run, Pa. Fabricators report that they are now able to get better prices for work, and the whole structural market is in more satisfactory condition than for some time. Prices are strong. We quote beams and channels up to 15 in. at 1.35c. and 1.40c. Pittsburgh.

Steel Plates.—No important orders for steel cars were placed in the past week, but there are persistent reports that the Pennsylvania Railroad will shortly come in the market for 10,000 to 15,000 cars or more. The Northern Navigation Company has placed a contract for a passenger boat with the Western Dry Dock & Shipbuilding Company, and the plates and shapes, about 3000 tons, will be rolled by the Carnegie Steel Company. The plate situation is very strong. The absolute minimum on $\frac{3}{4}$ -in. and heavier plates is 1.35c., while some mills that can make reasonably prompt shipments claim they are able to get as high as 1.45c. to 1.50c. The Jones & Laughlin Steel Company is holding plates at 1.40c. and will not shade this price. We quote $\frac{3}{4}$ in. and heavier plates at 1.35c. to 1.40c., f.o.b. Pittsburgh.

Iron and Steel Bars.—Specifications against contracts for both iron and steel bars are still coming into the mills at an enormous rate, while the new demand is also quite heavy. The leading steel bar mills are from 8 to 12 weeks back in deliveries, and prompt steel bars are bringing a premium of about \$2 a ton. The mills rolling iron bars are also very busy and are back in shipments. We quote steel bars on new orders at 1.30c. to 1.35c. and common iron bars at 1.40c. to 1.45c., f.o.b. Pittsburgh.

Sheets.—Effective August 15, the American Sheet & Tin Plate Company announced an advance of \$1 a ton on blue annealed sheets, making the price of No. 10 1.50c. per lb. This is the third advance made in blue annealed since the low market early in the year. The whole sheet market is very strong. The volume of new business is large, while specifications against contracts are heavy, all the mills being back in shipments anywhere from three to eight weeks. Some mills are having trouble in getting bars fast enough. Mills that are able to take business in sheets, and can promise reasonably quick shipments, are able to get premiums of \$1 to \$2 a ton over regular prices. It is not unlikely that sheets may be higher in the last quarter than they are now, as it is certain that sheet bars for fourth quarter will be advanced over present prices. The large sellers of sheet bars will fix prices for last quarter late in September or early in October. Prices are firm on the basis of 1.50c. for No. 10 blue annealed, 2.05c. for No. 28 black and 3.15c. for No. 28 galvanized in carload lots, f.o.b. mill, jobbers charging the usual advances for small lots from store.

Tin Plate.—Reports were current last week that an advance of 10c. per base box on tin plate had been made, but such was not the case. None of the makers will

take business for next year at present prices, and it is the general impression that between now and October 1 there will be an advance of 10c. and possibly 15c. The market is very firm on the basis of \$3.50 per base box for 14 x 20 coke plates.

Bolts and Rivets.—The makers of rivets have made another advance of \$3 a ton. The new demand is heavy, and specifications are coming in very freely. All the makers are behind in deliveries, and seem to be getting further back. We now quote button head structural rivets at \$1.80 per 100 lb. base, and cone head boiler rivets at \$1.90 in carloads only, an advance of 10c. to 15c. being charged for smaller lots. On account of the continued advances in raw materials, it is probable that the bolt makers will advance their prices about 10 per cent. Present discounts are as follows: Coach and lag screws, 80 and 17½ per cent. off; small carriage bolts, cut threads, 80 and 5 per cent. off; small carriage bolts, rolled threads, 80 and 10 per cent. off; large carriage bolts, 75 and 5 per cent. off; small machine bolts, rolled threads, 80 and 15 per cent. off; small machine bolts, cut threads, 80 and 10 per cent. off; large machine bolts, 75 and 10 per cent. off; square hot-pressed nuts, blank and tapped, \$6.20 off, and hexagon nuts, \$7 off. These prices are in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works.

Hoops and Bands.—The new demand is heavy and specifications against contracts are coming in freely. All the makers of hoops and bands are away back in deliveries. We quote steel bands at 1.30c., with extras as per the steel bar card, and hoops at 1.40c. to 1.45c., f.o.b. at mill, the latter price being obtained where reasonably prompt shipments are specified.

Shafting.—Conditions in this trade are more satisfactory than for a long time. The new demand is good, and specifications are heavy. All the shafting makers are back in deliveries, and we are advised that prices are being firmly held. We quote cold rolled shafting at 64 per cent. off in carload and larger lots and 59 per cent. off list in less than carloads delivered in base territory.

Spelter.—The market has shown a sharp advance in the past week. The new demand is reported very active and still higher prices are predicted. We quote prime grades of Western spelter at 6.90c., East St. Louis, equal to 7.02½c., Pittsburgh. A sale of 100 tons was made early last week at about 6.85c., East St. Louis, for September delivery.

Railroad Spikes.—The spike makers are simply deluged with business, and are anywhere from six to eight weeks back in shipments. All the railroads are specifying heavily against contracts, and in cases where they are not able to get prompt deliveries they are sending in new orders. The Baltimore & Ohio and the Pennsylvania Lines West have each bought 1000 kegs. Prices are very strong and we quote railroad spikes, base size, $\frac{5}{8}$ x 9/16 in., at \$1.65 and small railroad and boat spikes at \$1.70 to \$1.75 per 100 lb., f.o.b. Pittsburgh. Some makers of spikes that are filled up for three months or more are naming slightly higher prices.

Wire Products.—Makers of wire and wire nails report that the new demand in the past two weeks has been quite heavy, and specifications against contracts are coming in very freely. It is stated that all the mills are holding wire nails firm at the \$1.65 price, all new orders being entered at this figure. The leading mills are running to practically full capacity, and with the expected heavy fall business that will soon open up will likely continue to run full over the next several months. It is the general expectation that within a short time a further advance of at least \$1 a ton will be made in wire products. Prices are very strong and we quote wire nails at \$1.65; cut nails, \$1.60; galvanized barb wire, \$1.95; painted, \$1.65; annealed fence wire, \$1.45, and galvanized fence wire, \$1.75, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Steel.—The mills are getting further behind in deliveries, the new demand being heavy and specifications against contracts coming in freely. Prices are firm and slightly higher and we now quote: Iron finished tire, $1\frac{1}{2}$ x $\frac{3}{4}$ in. and larger, 1.30c., base; under $\frac{3}{4}$ in., 1.40c.; planished tire, 1.50c.; channel tire, $\frac{3}{4}$, $\frac{7}{8}$ and 1 in., 1.80c.; $1\frac{1}{8}$ in. and larger, 1.65c.; toe calk, 1.85c., base; flat sleigh shoe, 1.35c.; concave or convex, 1.70c.; cutter shoes, tapered or bent, 2.30c.; spring steel, 1.90c.; machinery steel, smooth finish, 1.70c., all f.o.b. cars, Pittsburgh.

Merchant Pipe.—Some months ago, when conditions in the pipe trade were only fairly good, pipe mills were advising their customers to buy more freely and lay in stocks in anticipation of the heavy demand. It

is now here with a rush. This advice was not followed to much extent, with the result that stocks of pipe held by jobbers are light, and there is an enormous demand from consumers which the jobbers are not able to supply promptly, and they are now trying to get as prompt deliveries from the mills as they usually get when business is running fair, but the order books are crowded and the mills are sold up from six weeks to two months and are far back in shipments. Several leading pipe makers state that they could close their offices for the next two months or more, and still have enough business to run full pretty well up to the close of the year. Discounts on both iron and steel pipe are said to be rigidly held. It is intimated that an advance may be made in the near future.

Boiler Tubes.—Present conditions in the boiler tube trade are identical with those in pipe. All the mills making locomotive and merchant tubes are filled up for two and three months and jobbers are pushing the mills for prompt deliveries which they are unable to get. The new demand for seamless tubing is very heavy. It is announced that the Pittsburgh Steel Company, which is now making Shelby steel tubing to the extent of about 1500 tons per month, has bought some German patents for making seamless tubing and will install equipment at Monessen for making tubing under these patents. Discounts on merchant and locomotive tubes are being firmly held and prices on charcoal iron tubes have recently gone up two points, or about \$4 per ton.

Coke.—Conditions in the coke trade are fairly active, there being a good demand for furnace coke for prompt shipment and also some inquiry for delivery over the remainder of the year. The Producers' Coke Company, Uniontown, Pa., which is the selling agency for furnace coke for a number of the coke producers in the Connellsville region, has recently taken a number of contracts for furnace coke for last half of the year delivery. One contract is for 6000 tons per month, another 3000 tons and a third contract for 5000 tons, all of this business having been closed at \$2.25 per net ton, at oven. Two leading producers of coke are not willing to contract for remainder of the year delivery at \$2.25, but are selling coke from month to month, believing that prices will soon be higher. We note sales of about 7500 tons of prompt furnace coke at \$2.25, at oven, and 2500 tons per month at the same price to a Mahoning Valley interest, for the remainder of the year. There is a fair demand for foundry coke and prompt selling at \$2.40 to \$2.50, at oven. We quote standard makes of coke for delivery over all of this year at \$2.25 per net ton, at oven. We quote 72-hr. foundry coke for prompt shipment at \$2.40 to \$2.50 and for remainder of the year at \$2.50 to \$2.75, at oven. The output of coke in the upper and lower Connellsville regions last week was 385,967 tons, an increase of 6000 tons.

Iron and Steel Scrap.—The great improvement in all other branches of the steel trade is finally being reflected in scrap, the new demand for which is much better, while prices are showing a firmer tone and are somewhat higher. The congested conditions at the mills as regards deliveries of scrap in the Pittsburgh district are improved, and at present there are no embargos on at any consuming points. The American Steel Foundries has bought in the past week about 5000 tons of heavy steel scrap for which it paid \$14 per gross ton, delivered at its Alliance, Ohio, works. We also note sales of 500 tons of cast iron borings at \$10, and 1200 tons of turnings at close to \$11, delivered. Prices on heavy steel scrap, machine shop turnings, cast iron borings and No. 1 railroad wrought scrap are higher. Dealers quote as follows, per gross ton:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery	\$13.75 to \$14.00
No. 1 foundry cast	13.00 to 13.25
No. 2 foundry cast	11.50 to 11.75
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	12.25 to 12.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	15.00 to 15.25
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	9.75 to 10.00
Low phosphorus melting stock	16.00 to 16.25
Iron car axles	24.50 to 25.00
Steel car axles	16.50 to 16.75
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.25
*Cast iron borings	10.00 to 10.25
*Machine shop turnings	10.75 to 11.00
†Sheet bar crop ends	14.75 to 15.00
Old iron rails	15.75 to 16.00
No. 1 R. R. wrought scrap	14.75 to 15.00
Heavy steel axle turnings	11.00 to 11.25
Stove plate	10.25 to 10.50

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Chicago

CHICAGO, ILL., August 20, 1912.

Rail inquiries and sales for 1913 delivery aggregating 220,000 tons are reported in this market. Large orders for track fastenings are also noted. The Chicago, Milwaukee & St. Paul placed contracts for over 5000 tons of bridge structural material. Agricultural implement manufacturers have begun to specify against their contracts for bars and special shapes for winter delivery, and these specifications are bringing to the mills considerable tonnage on contracts placed months ago at about 1.15c., Pittsburgh. With the exception of an inquiry by the Pennsylvania Lines West for 50 locomotives transactions have involved orders for only one or two engines coming from many buyers. The same road has placed orders for 1000 cars. It is understood that the mills are protecting car builders on an aggregate of 4000 to 5000 cars, for which inquiry is now pending. The largest of these is one for 2000 cars for the Canadian Pacific. Some prompt delivery requirements of steel bars have been filled with Bessemer steel and other orders in small lots have been taken by small Western mills of limited capacity. Both Northern and Southern pig iron continue to be firmly held, which position on the part of the furnaces is supported by an active interest on the part of melters, particularly for first quarter shipment.

Pig Iron.—With the exception of a transaction involving a large tonnage of foundry and malleable iron for a melter in the Milwaukee district sales in the past week have been very generally of moderate size. A few sales of 2000 tons are noted, but orders in the neighborhood of 500 tons were numerous. A considerable proportion of the business now being placed consists of small lots with which melters are supplementing their previous purchases for the remainder of this year. In addition local furnaces are selling freely for first quarter shipment and a considerable tonnage of such business is being placed. It has not developed as yet that Southern furnaces are following suit, and no serious quotations on Birmingham iron for first quarter delivery are known to have been made. For fourth quarter shipment Southern iron continues on the basis of \$12, Birmingham, though some furnaces are asking a premium, particularly for higher manganese irons. Local furnaces are adhering firmly to the \$15.50 basis, f.o.b. furnace for prompt shipment, with a premium of 50c. a ton for first quarter delivery. We quote local irons, f.o.b. furnace, the average switching charge to Chicago foundries being nearly 50c. per ton. Other quotations are for Chicago delivery on prompt shipments as follows:

Lake Superior charcoal	\$16.25 to \$16.75
Northern coke foundry, No. 1	16.00
Northern coke foundry No. 2	15.50
Northern coke, foundry, No. 3	15.00
Northern Scotch, No. 1	16.50 to 17.00
Southern coke, No. 1 foundry and No. 1 soft	16.85
Southern coke, No. 2 foundry and No. 2 soft	16.35
Southern coke, No. 3	15.85
Southern coke, No. 4	15.35
Southern gray forge	14.85
Southern mottled	14.85
Malleable Bessemer	15.50
Standard Bessemer	16.75
Basic	15.50
Jackson County and Kentucky silvery, 6 per cent.	17.40
Jackson County and Kentucky silvery, 8 per cent.	18.40
Jackson County and Kentucky silvery, 10 per cent.	19.40

Rails and Track Supplies.—Among rail inquiries which have been closed or are pending in this market for 1913 delivery are 80,000 tons for the Chicago & Northwestern; 100,000 to 125,000 tons for the Chicago, Milwaukee & St. Paul and 15,000 tons for the Great Northern. The railroads are also actively interested in track fastenings, an order of 1000 kegs of spikes for the Great Northern being an instance. The Kansas City, Mexico & Orient is reported to have placed an order for 8500 tons of rails with the Pennsylvania Steel Company. We quote standard railroad spikes at 1.75c., base; track bolts with square nuts, 2.10c. to 2.15c., base, all in carload lots, Chicago; tie plates, \$30 net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.20c. to 1.25c.; 16 to 20 lb., 1.25c. to 1.30c.; 12 lb., 1.30c. to 1.35c.; 8 lb., 1.35c. to 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—Mills have figures out on the structural material required for pending inquiries on 4000 to 5000 cars. These inquiries include 2000 for the Canadian Pacific, 500 for the San Antonio & Aransas Pass, and 1000 for the Illinois Central. The Pennsylvania Lines West have placed orders for 500 cars with the Pressed Steel Car Company and a like number with the American Car & Foundry Company. This road is now inquiring for 50 locomotives. New contracts for

fabricated structural material reported during the week total over 11,000 tons, 5000 tons of which was placed by the Chicago, Milwaukee & St. Paul for bridge work. Of this latter business the American Bridge Company will furnish 2668 tons and the Strobel Steel Construction Company 2351 tons. The St. Francis Hotel Annex, San Francisco, will require 2000 tons, and the steel tower for the Pacific Gas & Electric Company, 1500 tons, all of which will be furnished by Milliken Bros. The St. Paul Foundry Company will furnish 227 tons for the Kitchi Gammi Club, Duluth, Minn. We quote for Chicago delivery, mill shipment, for plain shapes, 1.53c., and from store 1.90c.

Plates.—The general situation as regards plates offers little that is new. For universal plates in particular deliveries are especially protracted, while for sheared plates from four to six weeks is being required. The major portion of this business, where premiums have not been asked, has been going on the basis of 1.40c., Pittsburgh, rather than the nominal price of 1.35c. Plate makers are the more satisfied with the 1.40c. basis because it re-establishes the spread of \$2 a ton over bars. We quote for Chicago delivery, mill shipment, 1.58c., and from store, 1.90c.

Sheets.—From most mills selling in this territory it is possible to obtain galvanized sheets in from six to eight weeks. The situation with regard to blue annealed is more variable, with some of the larger mills better able to make shipments than the smaller makers. Blue annealed sheets are \$1 a ton higher, and prices for black and galvanized sheets are firmly on the basis of 2.05c. and 3.15c. respectively, Pittsburgh. We quote, Chicago delivery, as follows: Carload lots, from mill, No. 28 black sheets, 2.23c.; No. 28 galvanized, 3.33c.; No. 10 blue annealed, 1.68c. Prices from store are: No. 10, 2.05c.; No. 12, 2.10c.; No. 28 black, 2.55c., and No. 28 galvanized, 3.65c.

Old Material.—Nearly all the large consumers of scrap in this territory, particularly rolling mills, have an abundant stock and are content to assume a negative attitude in buying, taking only such material as appears to be particularly attractive. This attitude has prevented any advance in rolling mill grades and at the same time melters seem able to keep pace with their daily consumption. The situation as regards foundry scrap is somewhat different, and foundries are satisfying their requirements with no little difficulty. Railroad malleable in particular is scarce, the explanation for which may be found in the unusually light offerings from railroads. The only lists offered the past week were one of 2000 tons from the Chicago, Burlington & Quincy and one of 800 tons from the Chicago & Alton. We quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.	
Old iron rails	\$16.00 to \$16.50
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft.	12.75 to 13.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50
Shoveling steel	11.75 to 12.25
Steel axle turnings	9.50 to 10.00
Per Net Ton.	
Iron angles and splice bars	\$14.50 to \$15.00
Iron arch bars and transoms	16.00 to 16.50
Steel angle bars	11.25 to 11.75
Iron car axles	19.75 to 20.25
Steel car axles	15.75 to 16.25
No. 1 railroad wrought	12.25 to 12.75
No. 2 railroad wrought	11.25 to 11.75
Cut forge	11.25 to 11.75
Steel knuckles and couplers	11.25 to 11.50
Steel springs	11.75 to 12.25
Locomotive tires, smooth	12.50 to 13.00
Machine shop turnings	7.25 to 7.75
Cast and mixed borings	6.50 to 7.00
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.75 to 8.25
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	12.25 to 12.75
Stove plate and light cast scrap	10.25 to 10.75
Railroad malleable	12.25 to 12.75
Agricultural malleable	10.75 to 11.25
Pipes and flues	9.50 to 10.00

Bars.—The mills are beginning to receive specifications from agricultural implement manufacturers for winter delivery of steel bars applying against the annual contracts placed some months ago. Bar iron prices in this market continue to advance, and where a week ago some business was being placed at 1.45c. that quotation is now the ruling figure and orders taken at \$1 a ton more are not unusual. At the same time very desirable specifications might still bring out prices close to 1.40c. A user of steel bars entered the market for 3000 tons and supplied a portion of his requirements with Bessemer bars from an Eastern mill, a very prompt delivery

being possible. We quote as follows: Bar iron, 1.40c. to 1.50c.; hard steel bars, 1.35c.; soft steel bars, 1.48c., and from store, soft steel bars, 1.80c., Chicago.

Cast Iron Pipe.—Proposals received at Akron, Ohio, on 12,000 tons of pipe brought out a considerable aggregate differential between steel and cast iron, and as a result the final awarding was postponed. At Elyria, Ohio, 600 tons was awarded August 19. A number of smaller cities in Michigan, Illinois, and Iowa are preparing for waterworks extension. The advance in pig iron prices has been followed by a sharp increase in the price of cast iron pipe, particularly in the smaller sizes. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$30; 6 to 12 in., \$28; 16 in. and up, \$27, with \$1 extra for gas pipe.

Wire Products.—Wire nails continue to be the most active of the various products in this branch, but prices are not more firmly maintained than for barb wire and fencing, the demand for which is temporarily light. The situation is strongly supported, not only by the fact that advances in other finished products have been more marked than in wire but also by the outlook for a rapidly increasing demand within the next few weeks. We quote as follows: Plain wire, No. 9 and coarser, base, \$1.63; wire nails, \$1.83; painted barb wire, \$1.83 to \$1.88; galvanized, \$2.13; polished staples, \$1.88; galvanized, \$2.18, all Chicago.

Rivets and Bolts.—The advance of \$3 a ton on rivets has been made effective in this territory. Local mills are not heavily oversold on rivets and current business can be taken care of with reasonable promptness. New discounts for bolts and screws are expected to be announced within a few days. We quote as follows: Carriage bolts up to $\frac{3}{4}$ in. x 6 in., rolled thread, 80 and 10; cut thread, 80 and 5; larger sizes, 75 and 5; machine bolts up to $\frac{3}{4}$ in. x 4 in., rolled thread, 80 and 15; cut thread, 80 and 10; larger sizes, 75 and 10; coach screws, 80 and 17 $\frac{1}{2}$; hot pressed nuts, square head, \$6.20 off per cwt.; hexagon, \$7 off per cwt. Structural rivets, $\frac{3}{4}$ to 1 $\frac{1}{4}$ in., 1.98c., base, Chicago, in carload lots; boiler rivets, 0.10c. additional.

Philadelphia

PHILADELPHIA, PA., August 20, 1912.

A decidedly active movement in both steel making and foundry grades of pig iron has developed. Some purchases cover deliveries extending into the first quarter of next year. Aggregate sales of basic iron on the recent movement will total close to 60,000 tons, with first quarter iron showing an advance of 40c. to 50c. a ton over third quarter. Consumers of malleable pig have been extensive buyers. Inquiries show an increase, consumers endeavoring to get in ahead of advancing prices. The Pennsylvania Railroad has inquiries out for a total of 10,800 tons of pig iron for its Altoona shops, for fourth quarter. About an even volume of new business is coming to makers of finished products. Prices of plates, shapes and steel bars have been advanced by some makers \$1 a ton, and premiums continue to be paid for early deliveries. Mills are operating at full capacity but the shortage of labor still prevents a maximum output. Steel billets have been sold freely and base prices are higher. Further inquiry for steel rails continues to develop. Shipbuilders are actively engaged, and have considerable business under negotiation. Two small boats for the Chesapeake Steamship Company are expected to be placed at an early date. Iron bars are in better demand and premiums continue to be paid for prompt steel bars. The old material market has developed marked strength. Heavy melting steel scrap is particularly strong and is being largely held for higher prices.

Iron Ore.—There has been practically an entire absence of business, although with the productive capacity of pig iron makers increasing a better movement is shortly expected. Importations at this port during the week include 5824 tons from Sweden, 5781 tons from Spain, 2500 tons from Venezuela, 5050 tons from New Brunswick and 5350 tons from Cuba. July importations totaled 92,825 tons.

Pig Iron.—Activity has been more pronounced than for a long time. Consumers are coming into the market freely and endeavor to cover for extended delivery. The most important movement has been in steel making grades. One Eastern melter, who recently purchased a round lot of basic for fourth quarter, has taken two 10,000-ton lots for first quarter of 1913 at \$16.15, delivered, and slightly higher. This melter is now pretty well covered for first quarter, but may take on additional tonnage. A sale of a block of 5000 tons

of basic for fourth quarter to another consumer at a price close to \$16, delivered, is also noted. An inquiry for 6000 to 7000 tons of basic for fourth and first quarter is now before the trade. Merchant furnaces making basic iron are pretty well sold up at their present productive rate and several are out of the market. Low phosphorus iron has been more active, with sales of a 3000 ton lot and several smaller blocks of standard analysis iron reported at \$21 minimum, delivered. Negotiations are pending for a round lot of Bessemer iron. In foundry iron, malleable pig has been quite active and several round lots have been taken by consumers in this district at varying prices. Virginia foundry has also developed considerable activity. Virginia producers have been selling fourth quarter No. 2 x and No. 2 plain for New England, Western and this district delivery quite freely. The majority of sales have been on the basis of \$14, furnace, for No. 2 x although one interest has made heavy sales at \$13.75, but it is understood to have decided to withdraw that quotation, which would put all Virginia No. 2 x on a \$14, furnace, basis. The bulk of the sales of eastern Pennsylvania foundry grades have been in moderate and small lots. Producers are so well sold ahead, against present productive capacity, that they are not forcing business and several have temporarily withdrawn from the market. Standard analysis iron is no longer available under \$16, delivered, for No. 2 x and in instances up to \$16.50 is quoted. Inquiries continue fair, the most important being that of the Pennsylvania Railroad, which is now in the market for 2100 to 4200 tons of No. 2 x, 2100 to 4200 tons of No. 3, 600 to 1200 tons of Northern charcoal and 600 to 1200 tons of Southern charcoal, for fourth quarter delivery at Altoona. Other consumers are feeling the market, but few large definite inquiries are reported. Cast iron pipe makers have not been active buyers, although negotiations are under way for 5000 tons of low grade for one of the Delaware River makers. Another consumer has inquiries out for 1000 tons of No. 3 and 1000 tons of forge for fourth quarter. Odd lot sales of off irons have been made to several consumers in this district. Forge iron for rolling mill purposes has been somewhat more active and higher prices are noted. A round lot was moved at a price equal to \$15.75, delivered. Moderate sales have also been made at \$15.50, delivered. The market is decidedly strong and prices are firm, showing an advancing tendency. Producers show little disposition to sell ahead. The following range of prices for standard brands in moderate lots, delivered in buyer's yards in this district, is named:

Eastern Pennsylvania No. 2 X foundry....	\$16.00 to \$16.25
Eastern Pennsylvania No. 2 plain.....	15.75 to 16.00
Virginia No. 2 foundry.....	16.80 to 17.00
Virginia No. 2 plain.....	16.55 to 16.75
Crav forge.....	15.50 to 15.75
Basic.....	16.00 to 16.25
Standard low phosphorus.....	21.00 to 21.50

Ferroalloys.—The demand has been rather quiet. Sellers are in a peculiar position; while \$51, Baltimore, is nominally quoted, offers must be cabled to makers for approval and practically no tonnage is accepted, particularly for this year's delivery. Higher prices are looked for daily. Very little demand for ferrosilicon is noted; prices, while strong, are unchanged. Importations at this port in July were 3066 tons of ferromanganese and 222 tons of ferrosilicon.

Billets.—A sale involving upward of 10,000 tons of rolling billets to a Western consumer is reported. This is understood to be for fourth quarter delivery and at recent market prices, although a higher base is now used for current quotations. Actual selling prices depend on the customer, specification and delivery, premiums of several dollars a ton often being named. Mills are taking a good volume of orders, but are making no efforts to force business. Prices of basic open-hearth rolling billets are based on \$25.40 to \$25.90, delivered in this district, while forging billets are quoted on a basis of \$30.40, delivered here.

Plates.—There has been no diminution in the demand. One Eastern mill reports last week as the best in its history in point of number as well as volume of orders placed. Structural material, boiler and locomotive plates are being heavily specified. New business is coming in freely and premiums continue to be paid for good deliveries. One contract for fourth quarter, involving 5000 tons, was closed at several dollars premium over recent quotations. Mills unable to make deliveries have, as a rule, not made any advance in quotations, although those making fair deliveries have announced an advance of \$1 a ton, making sheared plates 1.55c. minimum and universal plates 1.60c. minimum, delivered here. At this basis prompt delivery is not

assured, premiums being necessary to obtain favorable delivery.

Structural Material.—Fabricators are in instances unable to operate to full capacity, owing to the inability to get satisfactory delivery of plates and shapes without paying heavy premiums. Makers of plain shapes have been booking good orders and deliveries are, if anything, more extended. Rolling schedules are filled in most cases for six or eight weeks, and mills have advanced minimum prices for plain shapes to 1.55c., delivered here, in addition to which premiums of several dollars a ton are necessary to get good deliveries. Fabricated work in this district has been confined to small projects. Some fair sized business, including a 1700-ton job in the South, is reported closed, while other good contracts are pending.

Sheets.—The demand continues heavy. Mills are fully engaged and prices depend on what consumers, who want good deliveries, will pay. Specifications against contracts are heavy and mills are getting further behind on deliveries. While 1.65c., delivered, is nominally quoted for No. 10 Western sheets, delivered here, higher prices have been paid. Eastern mills making smooth loose-rolled sheets easily obtain ¼c. to ½c. per lb. more than Western prices, with additional advances for prompt deliveries.

Bars.—A sharp demand is noted for steel bars, and prices, while nominally quoted at 1.45c. to 1.50c. here, are subject to premiums of several dollars a ton for prompt shipment. In instances as high as 1.70c., delivered, has been paid for prompt bars from stock. Agricultural implement makers are now specifying heavily against orders. A very fair demand for iron bars is noted and with deliveries on steel bars hardening more business is being diverted to iron bars and makers are showing more firmness as to prices, which range from 1.37½c. to 1.42½c., delivered here, for ordinary bars.

Coke.—While consumption of both foundry and furnace grades is increasing, new business has not been particularly active. Foundry coke is firmer and moderate sales are reported at \$2.60 to \$2.75 at oven. Several moderate tonnages of furnace coke for extended delivery have been reported at \$2.25 to \$2.30. A number of makers are still holding at a slightly higher level. The following range of prices, per net ton, is named for delivery in buyers' yards in this district:

Connellsville furnace coke.....	\$4.10 to \$4.60
Connellsville foundry coke.....	4.55 to 4.70
Mountain furnace coke.....	3.70 to 4.20
Mountain foundry coke.....	4.15 to 4.30

Old Material.—The market is gradually gaining strength, and, with mills becoming more and more actively engaged, holders of stocks are becoming less inclined to dispose of material at present prices. Offers of \$14, delivered, fail to bring out tonnage of No. 1 heavy melting steel scrap, as in many cases brokers will pay that price with a view of holding the material. In a number of instances brokers name \$15, delivered, as a price for heavy melting steel and would not sell any quantity at that figure. The market is gradually developing a speculative tendency. As high as \$16.50, delivered, is reported to have been paid for No. 1 railroad wrought. The scarcity of common labor to handle scrap at mill yards has restricted to a considerable extent the use of scrap not in sizable shape. While little business is moving, the following range of prices about represents bids and offers for material delivered in buyers' yards in this district, taking a freight rate varying from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel scrap and crops.....	\$14.00 to \$14.50
Old steel rails, rerolling (nominal).....	15.50 to 16.00
Low phosphorus heavy melting steel scrap ..	17.50 to 18.00
Old steel axles.....	17.50 to 18.00
Old iron axles.....	24.00 to 25.00
Old iron rails (nominal).....	16.50 to 17.00
Old car wheels.....	14.00 to 14.50
No. 1 railroad wrought.....	16.00 to 16.50
Wrought iron pipe.....	13.00 to 13.50
No. 1 forge fire.....	12.00 to 12.50
No. 2 light iron (nominal).....	7.50 to 8.00
Wrought turnings.....	10.75 to 11.25
Cast borings.....	9.75 to 10.00
Machinery cast.....	13.75 to 14.25
Grate bars, railroad.....	10.50 to 11.00
Stove plate.....	10.50 to 11.00
Railroad malleable (nominal).....	12.00 to 12.50

Cleveland

CLEVELAND, O., August 20, 1912.

Iron Ore.—Quite a round tonnage of ore was sold at regular prices during the week, including both Bessemer and non-Bessemer grades. Some inquiry is still pending but it is believed that the demand will be considerably lighter for the remainder of the season

than it has been in the past few weeks. While prices are being well maintained, some standard Old Range Bessemer and possibly off-grade Mesaba ores can be bought at a concession from regular quotations. When ore sales are made, sellers cover as quickly as possible for vessel tonnage. Practically all lake boats are now employed. The demand for vessel capacity is very active, this being due to some extent to delays caused by fogs. Carrying charges on grain and lumber have been advanced but ore rates so far are unchanged. We quote prices as follows: Old Range Bessemer, \$3.75; Mesaba Bessemer, \$3.50; Old Range non-Bessemer, \$3.05; Mesaba non-Bessemer, \$2.85.

Pig Iron.—The market is very firm and a moderate volume of business is being placed. Many consumers of foundry iron appear anxious to cover for their first half requirements and considerable tonnage has been sold for that delivery, most of it apparently being booked at about 25c. above the present market prices. A central Ohio consumer is reported to have bought about 1000 tons of No. 2 foundry from a Cleveland furnace at \$14 for delivery through the first half. Some sales, however, are being made for that delivery at \$14.50 for No. 2 but \$14.25 appears to be the more general quotation. A local interest reports that it has sold about half of the output of two stacks for the first half delivery. One local furnace is now asking \$14.50, at furnace, for No. 2 foundry for Cleveland delivery over the remainder of the year. For outside shipment \$14 seems to be the minimum quotation. One local interest reports that sales of foundry grades during the week aggregating about 3000 tons were made. There is a fair volume of inquiry in lots ranging from 300 to 1200 tons. Some of these are for the fourth and first quarter and others for the first half. Southern iron is firm at \$12, Birmingham, for No. 2 for spot shipment and first half and some first half business has been booked at that price. Shipments on contracts continue heavy. For prompt shipment and for the remainder of the year we quote, delivered Cleveland, as follows:

Bessemer	\$15.40
Basic	\$14.25 to 14.50
Northern No. 2 foundry	14.25 to 14.50
Southern No. 2 foundry	16.35
Gray forge	13.50 to 13.75
Jackson County silvery, 8 per cent. silicon	17.55 to 18.05

Coke.—The market is inactive. Foundries are practically all under contract for the remainder of the year. The consumption is heavy and foundries are crowding sellers for deliveries. The market is firm, with no change in prices. We quote Standard Connellsville furnace coke at \$2.25 to \$2.30 per net ton at oven for prompt shipment and contract. Standard 72-hour Connellsville foundry coke is quoted at \$2.50 to \$2.90 for spot shipment and future delivery.

Old Material.—Mills would buy a heavy tonnage of heavy steel scrap for future delivery if they could place contracts for present prices, but dealers do not care to sell except for early delivery. The market is again firm and dealers believe that they may get a slight advance in prices a little later. Sharon is in the market for a round tonnage of heavy steel scrap. There is little local inquiry. Local mills are still holding back on shipments, but some of them will resume taking in scrap next week. Dealers' prices, f.o.b. Cleveland, are as follows:

Per Gross Ton.

Old steel rails, rerolling	\$13.25 to \$13.50
Old iron rails	14.00 to 14.50
Steel car axles	17.50 to 18.00
Heavy melting steel	12.75 to 13.25
Old car wheels	13.00 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	13.00 to 13.25
Light bundled sheet scrap	10.00 to 10.50

Per Net Ton.

Iron car axles	\$18.50 to \$19.00
Cast borings	7.25 to 7.50
Iron and steel turnings and drillings	8.00 to 8.25
Steel axle turnings	8.50 to 8.75
No. 1 busheling	11.00 to 11.25
No. 1 railroad wrought	12.50 to 13.00
No. 1 cast	11.50 to 12.00
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Finished Iron and Steel.—The heavy demand for material on contract continues and a good volume of new inquiry is coming out. A large number of small lot orders are being taken at premium prices. Eastern mills are taking orders in this market for structural material from stock for prompt shipment at 1.60c., Cleveland, or a premium of \$6.80 a ton. The leading interest is now quoting steel bars at 1.35c. and plates and shapes at 1.40c., Pittsburgh, where protection is desired for future delivery, also for less than carload

lots, and to buyers who are not regular customers. For the general run of business for future delivery 1.30c. for bars and 1.35c. for plates and shapes are the minimum quotations. The general situation regarding delivery appears unchanged. Some of the mills are about holding their own on shipments and others are getting further behind. Some have nothing to sell for the remainder of the year. The demand for structural material is heavy. Local fabricators are taking a large amount of small work for which they are getting good prices. Little inquiry is coming out for round lots. The Van Dorn Iron Works Company, Cleveland, has taken about 300 tons for new buildings for the Frost Wire Fence Company, Cleveland. The demand for sheets is heavy, but most of the mills are well filled up. Sheet prices are firm at 2.05c., Pittsburgh, for No. 28 black and 3.15c., Pittsburgh, for No. 28 galvanized. Rivets are firm at 1.80c., Pittsburgh, for structural and 1.90c. for boiler. There is a fair demand for forging billets, which are quoted at a minimum of \$29.20, Pittsburgh. Makers of hard steel bars have advanced prices to 1.30c., Pittsburgh, for carload lots and 1.35c. for less quantities. The demand for iron bars is heavy. The minimum quotation is 1.40c., Cleveland mills. Local warehouses have made another advance of \$2 a ton. Stock prices are now 1.85c. for steel bars and 2.05c. for plates and shapes.

Cincinnati

CINCINNATI, OHIO, August 21, 1912—(By Telegraph.)

Pig Iron.—For some time the buyer has had an advantage that was hard to overcome, but recent developments have placed the seller in a much more independent position. A general, though gradual, revival in business all over the country has brought out a much better inquiry, and contracting is heavier than for many months. The larger melters of pig iron are beginning to realize that the threatened car shortage will soon become a reality, and this has had a stiffening effect on prices, especially for nearby shipment. Southern producers are generally asking \$12, Birmingham, for any shipment this year, and the southern Ohio furnaces are firm at \$14, Ironton. Quotations for shipment for the first half of next year have not yet been definitely established. From \$12.50 to \$13, Birmingham, is asked for Southern iron and around \$14.50, Ironton, for southern Ohio No. 2 foundry. However, a few contracts for No. 2 foundry have been made with shipments extending into next year at \$12, Birmingham, and \$14, Ironton. Malleable is very active, and a sale aggregating 12,000 tons for first half delivery was made to an Indiana manufacturer, part of which tonnage is to be shipped to a Michigan branch. It is understood that Lake shore furnaces were able to book the larger part of this order at a figure approximating \$14 at furnace by taking advantage of the freight differential to the Michigan plant. Another Indiana consumer is expected to close soon for 1000 tons of malleable for prompt shipment, and from the same territory there is a healthy demand for both Northern and Southern foundry iron. High silicon irons are in better demand, and the price has gone up about 50c. a ton, with a still further advance in sight. Two local melters have taken about 500 tons each of Southern No. 2 foundry for this year's shipment and a nearby foundry booked the same quantity of Northern No. 2 foundry for first quarter delivery. A local agency reports the sale of 7000 tons of special iron, both Northern and Southern, to a Michigan melter for first half movement. Taking everything into consideration, the outlook from a seller's standpoint is more encouraging than for over two years. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	\$15.25 to \$15.75
Southern coke, No. 2 foundry and 2 soft	15.00 to 15.50
Southern coke, No. 3 foundry	14.50
Southern coke, No. 4 foundry	14.25
Southern gray forge	14.25
Ohio silvery, 8 per cent. silicon	17.70 to 18.20
Southern Ohio coke, No. 1	15.45 to 15.95
Southern Ohio coke, No. 2	15.20 to 15.70
Southern Ohio coke, No. 3	14.70 to 15.20
Southern Ohio malleable Bessemer	15.20
Basic, Northern	14.70
Standard Southern car wheel	25.75 to 26.00
Lake Superior charcoal	16.75 to 17.25

(By Mail)

Coke.—There is very little change in the coke situation. Nearby foundries are placing a few small orders, but this is not the season for large contracting. Several furnace operators have been investigating the mar-

ket, but, as far as known, the only late contract of note is one with a Southern buyer for 15,000 tons of 48-hr. coke to be delivered through the next six months. Connellsville and Wise County furnace coke prices remain around \$2.25 to \$2.40 per net ton at oven for any delivery this year. Pocahontas furnace brands are quoted as low as \$2 to \$2.10. Foundry grades in the Connellsville and Wise County fields are bringing from \$2.50 to \$2.75 per net ton, with shipments extended through the next six months, when desired. Pocahontas 72-hr. coke is quoted from \$2.25 to \$2.35. There is already some complaint as to a shortage in cars in the Pocahontas field, and all three districts continue to have trouble in securing sufficient labor to operate the ovens.

Finished Material.—Warehouse stocks are decreasing, and as a result of a diversified demand they are somewhat broken, and in a number of instances the jobbers are compelled to call on the mills to complete an order. As most of the mills are about six weeks behind, delays have occurred, and with the impending car shortage this trouble will likely increase as the fall season draws nearer. Steel bars are bringing 1.85c. to 1.90c. from stock, and structural material from 2c. to 2.05c. Mill prices are 1.30c. and 1.35c., Pittsburgh, respectively, although at least one local agency has instructions not to book any structural material business below 1.40c. Pittsburgh. Both galvanized and black sheets are in excellent demand, and the local mill is having trouble in keeping up with its orders. It has recently set as a minimum on No. 28 black sheets 2.05c. Pittsburgh and 3.15c. for the same gauge galvanized. Hoops and bands also show considerable improvement, and the question of making anything like prompt delivery is even now a momentous matter on nearly all finished material lines.

Old Material.—The market is very steady. While there have been no recent advances, prices quoted are firm, and there is also a slightly better demand from the rolling mills for different kinds of scrap. Railroad offerings are light, but if the market should advance any time soon, a number of railroads in the Central West would probably have some round tonnages to sell. The minimum figures given below represent what dealers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' selling prices f.o.b. at yards:

Per Gross Ton.	
Bundled sheet scrap	\$9.25 to \$9.75
Old iron rails	13.00 to 13.50
Relaying rails, 50 lb. and up	20.25 to 21.25
Re-rolling steel rails	11.25 to 11.75
Melting steel rails	10.25 to 10.75
Old car wheels	12.50 to 13.00
Per Net Ton.	
No. 1 railroad wrought	\$10.75 to \$11.25
Cast borings	6.50 to 7.00
Steel turnings	7.25 to 7.75
No. 1 cast scrap	11.00 to 11.50
Burnt scrap	7.75 to 8.25
Old iron axles	17.25 to 17.75
Locomotive tires (smooth inside)	12.00 to 12.50
Pipes and flues	7.25 to 7.75
Malleable scrap	8.75 to 9.25
Railroad tank and sheet scrap	6.75 to 7.25

Birmingham

BIRMINGHAM, ALA., August 19, 1912.

Pig Iron.—The minimum for No. 2 foundry pig iron at Birmingham furnaces today seems to be \$12, as far as standard grades are concerned. It is stated that consumers are no longer making any question of the figure. Several makers, who are sold well ahead into the fourth quarter, are considering higher prices, one of the leaders, who is practically sold out for the rest of the year, being inclined to look for \$13 for the first quarter of next year. One of the largest pig-iron makers says its sales are more than the output, which is a reiteration of last month's report from the same concern. A sale of 3000 tons on the \$12 basis was effected with a Northern broker representing an Alabama concern. It appears probable that the scarcity of Alabama iron which now exists will last, as the steel mills, pipe works and other home consumers are taking the larger portion of the output. Foundry demands are reported as on the increase. Minimum prices, f.o.b. cars at Birmingham, are as follows:

No. 1 foundry and No. 1 soft	\$12.00 to \$12.50
No. 2 foundry and No. 2 soft	11.75 to 12.00
No. 3 foundry	11.25 to 11.50
No. 4 foundry	10.75 to 11.25
Gray forge	10.50 to 11.00
Basic	11.50 to 12.00
Charcoal iron	22.50 to 23.00

Cast Iron Pipe.—There is no evidence of accumulations on the yards of pipe makers, while orders from various points promise continued operations on the

part of the Alabama plants. Shipments have been very heavy. There is a prospect of an advance in price owing to the condition of the iron market. Quotations may, however, be continued on the present basis, f.o.b. yards at Birmingham, per net ton, as follows: 4-in., \$24; 6 to 8-in., \$22; 10-in. and over, \$21.50.

Coal and Coke.—There is practically no change in the coal market with the exception of a greater demand for steam coal from the mills soon to operate. The coal operators expect a good fall and winter trade. Coke is moving in regular quantities at \$3.25 to \$3.75 per net ton, f.o.b. oven, with no competition from Virginia ovens, which are shut off by freight rates.

Old Material.—Cast scrap is still in demand, considerable quantities having been disposed of recently. Wrought iron and steel scrap are slow. Dealers continue to ask the following prices per gross ton, f.o.b. cars, Birmingham.

Wrought-iron car axles	\$15.00 to \$16.00
Old steel axles	13.50 to 14.50
Old iron rails	13.50 to 13.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	9.00 to 9.50
No. 1 steel	10.00 to 10.50
Tram car wheels	10.00 to 10.50
Standard car wheels	10.50 to 11.00
Light cast and stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, MO., August 19, 1912.

There has been no cessation the past week of the activity in the iron and steel market; instead, the situation has grown more acute and the buying heavier. There seems now no disposition to consider prices, the only question is the getting of the material ordered.

Pig Iron.—One of the most notable features of the week has been the appearance here of instructions to representatives of a number of furnaces to avoid quoting for 1913, but if a quotation is demanded to make it \$13 for No. 2 Southern, Birmingham basis, and then only for first quarter and subject to action by the furnace. The activity of the week has developed that nothing below \$12 is acceptable for No. 2 Southern at present, applying to both immediate and rest of the year shipment. Representatives here have received instructions to hold No. 2 Northern, Iron-ton basis, at \$14 to \$14.50 for rest of year and first quarter; Chicago No. 2 X at \$15.50 furnace, which is above a parity with Ohio iron, and Lake Superior charcoal iron at \$14.50 rest of year and \$15 first quarter. The sales of the week included about 8000 tons of malleable to the Missouri Malleable Iron Company, distributed among several representatives, and 10,000 tons to the American Car & Foundry Company, similarly distributed. Other sales of the week have included 1000 tons of No. 2 Southern, 800 tons of No. 2 Northern and a considerable number of orders of 200 to 500 tons, fairly well divided between Northern and Southern makers. The buying is general, applying to both large and small consumers, and there is at present no reason to anticipate a cessation of the movement here. It is not thought that the buying is due to a scare, but rather to a settled belief that there is no reason to expect any lower prices.

Coke.—Business has been in small lots, so far as new sales are concerned, but the movement forward has been heavy on specifications on contracts. No consumers in this territory are delinquent and many of them are ahead of contract requirements. Best 72-hr. selected Connellsville and Virginia foundry coke is quotable here at \$2.50 to \$2.75 per net ton at oven; Virginia 48-hr. furnace coke at \$2 to \$2.25 and Connellsville 48-hr. coke at \$2.25.

Finished Iron and Steel.—The movement forward during the week has continued heavy, but no large new business has appeared. In standard steel rails there were no sales, but in fastenings the demand grew more active, though without any further advance in prices. Deliveries are now so extended as to leave buyers in the hands of the manufacturers entirely. In light rails there is increased activity among the coal interests, while the lumber concerns are growing considerably more active. The tonnage sold was heavy, but no large individual sales appeared. Plates continue as last reported—practically impossible to get under four months, not even if premiums are offered, except in special instances. Bars are in good demand, and the wagon and agricultural implement trade is coming into the market very strongly. In structural material the orders are being given steadily and buyers are becoming reconciled to the delivery conditions.

Old Material.—In the scrap market the same buoyancy exists as in the other divisions of the trade. Prices are firmer and a number of advances are reported. The steel works and rolling mills are active buyers, and there is also a profit in shipping away, with the result that dealers are very optimistic. The demand for relayers is very strong and hard to fill. Lists out, closing later this week, are 500 tons from the Frisco, 600 tons from the Clover Leaf and 600 tons from the Chicago & Eastern Illinois. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton.	
Old iron rails	\$14.50 to \$15.00
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	11.00 to 11.50
Frogs, switches and guards cut apart.	11.00 to 11.50

Per Net Ton.	
Iron fish plates	\$12.50 to \$13.00
Iron car axles	18.50 to 19.00
Steel car axles	16.50 to 17.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	12.50 to 13.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	6.75 to 7.25
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	11.00 to 11.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	10.00 to 10.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	9.00 to 9.50
Machine shop turnings	7.50 to 8.00

Buffalo

BUFFALO, N. Y., August 20, 1912.

Pig Iron.—The market in this district has shown remarkable strength the past week. The interest of consumers continues unabated and the tonnage booked fully equals that of the previous week, being considerably over 75,000 tons. The total of unfilled inquiry now before sellers for consideration amounts to nearly 50,000 tons, a portion of it being for first half delivery. Some of the largest producers in the district have reached a point where they must decline to quote for shipment over the remainder of the year; their bookings having practically reached the capacity limit for that period. Such furnaces as have open capacity will undoubtedly be able to command a premium for such small tonnages as they will be free to supply for this year's delivery. A comparison of records shows that the volume of bookings of pig iron in the Buffalo district for the first half of August has been larger than for any like period in the past six years. The following schedule reflects the sharp advance which has taken place during the week, the prices quoted being for shipment over the remainder of the year and first quarter of 1913, f.o.b. Buffalo:

No. 1 foundry	\$15.25 to \$15.50
No. 2 X foundry	15.00 to 15.25
No. 2 plain	15.00
No. 3 foundry	14.75 to 15.00
Gray forge	14.75
Malleable	15.25 to 15.50
Basic	15.00 to 15.50
Charcoal, according to brand and analysis	16.50 to 18.00

Finished Iron and Steel.—Mills have not been able to catch up in any degree on their deliveries, but they are daily becoming more extended despite the pressure from consumers for early shipments. Users are readily paying premiums for prompt shipment where the material can be obtained; but some producers state they are declining to accept premium business, which necessarily works injustice to their regular contract customers. Warehouse prices are being advanced right along, a further advance of \$2 per ton having gone into effect this week. Warehouse prices are now upward of \$8 per ton over mill prices. Some agencies state that they have practically withdrawn from the market on new business for 1912 delivery, being booked to capacity for that period, and at the present rate of demand the majority of mills will soon be in the same sold out condition. Generally speaking, mills and agencies are not yet ready to open their books for 1913 business and probably will not be before the middle of next month. Prices are hardening and some agencies are now quoting 1.40c. Pittsburgh for plates and structural shapes and it is stated that one maker is asking 1.40c. Pittsburgh for bar material in some instances. Blue annealed sheets have advanced \$1 per ton and there has been a further advance of \$2 per ton on standard styles of triangle mesh reinforcement. Fabricated structural material continues to exhibit

great activity, the small jobbing business particularly being extraordinarily brisk with a good business in larger tonnages developing right along notwithstanding the extended deliveries now exacted by the mills. Bids are being received this week for the Ithaca High School, requiring 700 tons of steel, and bids will be received August 26 for an addition to the plant of the Shredded Wheat Company, Niagara Falls, taking 1000 tons. Bids for the state Normal School, Buffalo, 850 tons, are to be opened at Albany to-day, and bids will be received about September 1 for the State prison building at Comstock, N. Y., about 1000 tons. Metz Bros., Buffalo, received the general contract for the Curtiss store and office building and will at once sublet the steel contract, 550 tons. The Lackawanna Bridge Company, Buffalo, has received the contract for fabrication and erection of the steel work for the new plant of the Lima Locomotive Corporation, Lima, Ohio, requiring 2500 tons; also for the steel, 500 tons, for the boiler shops now building at Avis, Pa., for the New York Central.

Old Material.—Considerable improvement is noted in the demand for most lines of scrap, particularly for heavy melting steel, old iron axles, cast scrap and turnings and borings. Prices are much stronger, with slight advances in a number of grades. Some dealers are inclined to hold for a more pronounced increase before selling, believing that there will soon be a further betterment in demand, of which they desire to take advantage. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	\$13.00 to \$13.50
Low phosphorus steel	15.75 to 16.50
No. 1 railroad wrought	13.50 to 14.25
No. 1 railroad and machinery cast scrap	13.25 to 14.00
Old steel axles	15.25 to 16.25
Old iron axles	22.00 to 22.50
Old car wheels	13.25 to 13.75
Railroad malleable	11.75 to 12.25
Boiler plate, sheared	13.75 to 14.25
Locomotive grate bars	11.00 to 11.25
Wrought pipe	9.50 to 10.00
Tank iron	10.00 to 10.25
Wrought iron and soft steel trimmings	8.25 to 8.75
Clean cast borings	7.50 to 8.00

Boston

BOSTON, Mass., August 20, 1912.

Old Material.—The improved conditions noted in last week's report continue, with indications of an advance in the near future, which is to some extent being anticipated by brokers. Prices are unchanged for immediate shipment. The quotations given below are of prices offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	\$11.00 to \$11.25
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	19.50 to 20.00
Mixed shafting	13.50 to 14.00
No. 1 wrought and soft steel	10.00 to 10.50
Skeleton (bundled)	9.50 to 10.00
Wrought iron pipe	9.25 to 9.75
Cotton ties (bundled)	9.00 to 9.50
No. 2 light	4.50 to 5.00
Wrought turnings	7.50 to 8.00
Cast borings	6.75 to 7.00
Machinery, cast	12.50 to 13.00
Malleable	9.50 to 10.00
Grate bars	7.00 to 7.50
Stove plate	8.50 to 9.00
Cast-iron car wheels	12.00 to 12.50

New York

NEW YORK, August 21, 1912.

Pig Iron.—More inquiry has come up and prices are advancing, but in the immediate vicinity of New York the volume of business in the past week has not been large. In New Jersey purchases of upward of 2500 tons were made by one interest in the past ten days, but the most of this was previously reported. A sanitary pipe company has bought 3000 to 4000 tons. An inquiry for 1000 tons has come from a Newark foundry and two other New Jersey melters of foundry iron are in the market for from 1000 to 1500 tons. A good-sized inquiry for basic is also reported in New Jersey. There has been considerable activity in New England in the past ten days, one sale of 3000 tons being reported, while another interest has bought a total of about 5000 tons. There has been some large buying also by a textile machinery company, the estimates of

the amount ranging above 6000 tons. A large electric interest has come out with a round inquiry in which delivery over the first half of 1913 is asked. There are evidences that considerable business could be done for the first quarter of next year at the figures furnaces have recently been naming for the last quarter of 1912. The situation hinges on prices, the inclination of most sellers being to hold for a 50-cent advance over 1912 prices and they are not anxious to sell heavily on such a basis thus early. Virginia irons have sold in moderate lots for New England delivery, some basic being included. The largest Virginia seller has been asking \$13.75 for No. 2 X for fourth quarter. In some cases Virginia sellers have realized \$14 for delivery late this year and extending over into 1913. Eastern Pennsylvania furnaces are firmer at \$15.50 for No. 2 X foundry at furnace, the freight to tidewater being 70 cents. Pennsylvania furnaces having a higher freight have sold at \$15.25 at furnace for No. 2 X. The indications are that Buffalo sellers are now pretty well filled up for this year though there is some further capacity in that district which will probably be swung into line on foundry iron in the near future. An advance from \$14.50 at furnace to \$15 for No. 2 X has been asked by one Buffalo interest. We quote as follows for Northern iron at tidewater: No. 1 foundry \$16.25 to \$16.50; No. 2 X \$16 to \$16.25; No. 2 plain \$15.50 to \$15.75. Southern iron is quoted at \$16.25 to \$16.50 for No. 1 foundry and \$16 to \$16.25 for No. 2.

Finished Iron and Steel.—Fabricating works are becoming well filled up under the liberal contracting of recent weeks though so far as building work in New York City is concerned the past two weeks have not brought out much that is new. Eastern fabricating capacity will be fully occupied for the next three months and much of it is engaged well into the winter. In fact, except on small jobs on which quick action is wanted—and of these there is just now a considerable number—no delivery can be promised by the average plant short of three months. Among contracts recently closed by the American Bridge Company are the following: 1900 tons for Boston & Maine bridges at Lynn, Mass.; 3500 tons for the Fairmount Hotel which has long been pending at Philadelphia; 2500 tons for a new office building at 50 Broad street, New York; 800 tons for the W. R. Grace building. The Phoenix Bridge Company has taken some important New York Central work, including a bridge at Oswego, 1650 tons, one at Utica, 1500 tons, and one at Stockport, 1500 tons, a total of 4650 tons. The same company received the contract for a theater building at Bridgeport, Conn., 400 tons, and a bridge for the Lehigh Valley Railroad over the Lehigh River, at Glen Onoko, Pa. Other recent awards include the following: Merchants' National Bank, Boston, Mass., 1600 tons, to the Boston Bridge Works; Citizens' National Bank, Raleigh, N. C., 400 tons, to the Chesapeake Iron Works; two bridges for the Georgia Coast & Piedmont Railway, 400 tons, to the Virginia Bridge & Iron Works; the Fiske Rubber Company building, Chicopee Falls, Mass., 550 tons, to the Berlin Construction Company; Mutual Life Insurance Company building, Worcester, Mass., 250 tons, to the Eastern Bridge & Structural Company of Worcester; several small bridges on the Atlantic Coast Line, 300 tons; signal bridges on the New York Central, 300 tons, to Lewis F. Shoemaker & Co. New work on which inquiries have come out includes 2000 tons of station work for the Boston & Maine; three suburban station areas for the New York Central terminal, several hundred tons each; material for strengthening and extending seven bridges on the New York Central, 400 to 500 tons. In New Jersey a bridge is about to be let by the counties of Hudson, Essex and Hackensack, spanning the Passaic River between the towns of Belleville and Kearney, calling for 1000 to 1500 tons. The Government is advertising for additional fabricated steel for the Panama Canal, mostly for lock work. On the large requirements for the Brooklyn Rapid Transit extensions—a total of 90,000 tons with the possibility of 50,000 tons additional—bids are to go in August 22. Three additional sections of the Lexington Avenue subway extensions in this city are being advertised. The previous sections called for 8000 to 20,000 tons of steel each. As has been noted for some weeks, higher prices are being obtained on fabricated material, a number of recent contracts in the East being figured on a 1.40c. basis for structural shapes. The advance from the low point of the earlier months of the year now represents about \$8 a ton; on smaller, quick delivery jobs it is in some cases several dollars a ton more. The plate situation continues strong, and the volume of new business in Eastern territory in the past

week was quite large. Bar iron is in good demand and is selling at 1.30c. at Eastern mills, while some makers have been able to secure 1.35c. at mill. There is also a good business in track bolts and spikes. The mills could sell farther ahead than they have been willing to do thus far. Business with deliveries running six months ahead has come up, considerable of it from jobbers, but thus far 90 days is the limit considered by the mills. A further advance in nuts and bolts is looked for in view of a meeting of nut and bolt interests at Cleveland this week. Quotations are as follows: Steel bars, 1.46c.; plain structural material and plates, 1.51c. to 1.56c.; bar iron, 1.40c. to 1.45c., all New York. Plain material from store, 1.95c. to 2.05c.

Cast-Iron Pipe.—Prices have for some time shown a tendency to harden. As bids submitted on public lettings become known they are seen to show a steady advance on previous transactions of this character. This was demonstrated at Taunton, Mass., August 16, when a contract for 400 tons was awarded to the leading interest at \$23.40 per net ton delivered. The demand for small sizes from private buyers continues to be the feature of the market. Large sizes are still neglected, but for no definite reason. No public lettings of importance are in sight in this territory. Prices of carload lots of 6-in. are held at \$22 to \$23 per net ton, tidewater.

Old Material.—An all-round demand is experienced for old material but transactions seldom involve any lots of particular size. The steel works and rolling mills are not buying freely, but enough of them are in the market from time to time to make the movement rather satisfactory. An interesting event of the week was the sale of 1000 tons of cast scrap at \$14 delivered in eastern Pennsylvania. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting.....	\$11.25 to \$11.75
Heavy melting steel scrap.....	11.25 to 11.75
Relaying rails	21.00 to 21.50
Rerolling rails	13.00 to 13.50
Iron car axles	20.50 to 21.00
Old steel car axles	15.50 to 15.75
No. 1 railroad wrought	13.75 to 14.25
Wrought-iron track scrap.....	13.00 to 13.50
No. 1 yard wrought, long.....	12.50 to 13.00
No. 1 yard wrought, short.....	11.25 to 11.75
Light iron	5.00 to 5.25
Cast borings	7.00 to 7.25
Wrought turnings	8.50 to 8.75
Wrought pipe	11.00 to 11.50
Old car wheels	13.00 to 13.50
No. 1 heavy cast, broken up.....	11.50 to 12.00
Stove plate	8.75 to 9.00
Locomotive grate bars	9.00 to 9.25
Malleable cast	10.00 to 10.50

Ferroalloys.—In a market that is quiet, but strong, 80 per cent. ferromanganese is quoted at \$51, Baltimore, for future delivery, and in the last few days several hundred tons have been sold at that price. Delivery up to the end of the year is commanding from \$53 to \$56, but the demand is not active. The inquiries now before the trade for ferromanganese are said to aggregate between 1000 and 2000 tons for forward delivery and about 1000 tons for early delivery. Ferrosilicon, 50 per cent., is quiet at \$72.50 for carload lots and ranging down to \$70 for larger lots.

British Market Active and Strong

Stimulation from Foreign Advances—Pig Iron Output Overtaking Consumption

(By Cable)

MIDDLESBROUGH, England, August 21, 1912.

Activity in iron and steel continues. Transactions in all branches are only restricted by the heavy existing engagements, with producers and manufacturing buyers alike under pressure and behind in deliveries. No appreciable setback is likely while the home market is strengthened by upward tendencies abroad. The one possibility is of labor troubles in the fall when renewals of old agreements come up.

Middlesbrough pig iron output is now approaching a scale equaling consumption, but furnace deliveries are still behind contract schedules. The market is firm on speculative purchases, stimulated by an advance of 4 marks per ton in Luxembourg foundry iron, and by consumers buying warrants for immediate requirements. Stocks in Connal's stores are 287,114 tons, against 288,594 tons last week. We quote as follows, the advances being in pig iron, German steel bars and black sheets:

Cleveland pig iron warrants (closing Tuesday), 61s. 6d., against 61s. one week ago.

No. 3 Cleveland pig iron, maker's price, f. o. b. Middlesbrough, 62s., against 61s. 6d. one week ago. Cumberland hematite is 75s.

Steel sheet bars (Welsh) delivered at works in Swansea Valley, £6 2s. 6d.

German 2-in. billets, f.o.b. Antwerp, 100s.

German basic steel bars, f.o.b. Antwerp, £5 16s. 6d., an advance of 1s. 6d.

Steel bars, export, f.o.b. Clyde, £7 15s. to £7 17s. 6d.

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £7.

Steel ship plates, Scotch, delivered local yard, £8 2s. 6d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 5s., an advance of 2s. 6d.

Steel rails, export, f.o.b. works port, £6 7s. 6d. to £6 10s.

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 14s. 7½d., October-December.

(By Mail)

Every Available British Furnace Going

MIDDLESBROUGH, ENGLAND, August 10, 1912.

Within the last few weeks the Cleveland pig iron market has fairly got going again and the result has been seen in sharply advancing prices with great speculative activity. There have been sensitive intervals when rapid movements, some of a downward character, have been witnessed, but the main direction has been and still continues upward and it is the confident belief of speculators that 1912 will see a range of values established such as has not been attained since the halcyon days of 1900, when No. 3 Cleveland sold up to 78s. 3d. for cash delivery. The British output of iron is not just now susceptible of very much expansion, for practically every available furnace is in blast. Fuel supplies are abundant and no effort is being spared by makers to reap the extreme advantage of the present highly remunerative rates obtainable.

Consumption is easily taking up everything which is being produced and the inroads upon the visible supply continue, though the extent of the reduction in pig iron is not at all important so far this month. The chances, however, favor an extension of shipments later in the month, with no doubt a corresponding expansion in the deliveries from public stores. Cold blast pig iron, of which very little is now made and which is produced only in the Midland districts, has been raised by 5s. a ton to £6 5s.

The bar iron trade is in a wonderfully strong position and the advance of 10s. recently declared for marked bars to £9 10s. basis puts selling rates on a higher plane than since the early part of 1901, though the price stood at £11 10s. from February 1 to October 31 of that year. Scottish iron bars have been raised 7s. 6d. a ton, to take effect August 12, but many of the works are so jammed with orders that they have already refused to take further business for the present, preferring to look on for a while.

Steel is everywhere in a very favorable position and prices are buoyant. Buyers of hematite pig iron have lately shown much more interest in the market and some heavy business has been arranged with certain of the big Sheffield firms and also by Welsh and Scottish interests. The last named have paid as much as 82s. 6d. a ton, delivered. Preparations are being made to build a large new steel works at Port Talbot in Wales, and tin plate mills will probably form part of the plant. All the steel plate mills are being driven at maximum pressure, and the difficulty which has been chronic with shipyards of getting deliveries with the celerity desired is just as pronounced as ever. Supplies of semi-finished steel from abroad are scanty and prices have a strong tone, while in the virtual absence of competition British producers practically have the market at their feet.

The brass companies, says the Boston News Bureau, have never been so busy. The American Brass Company has long been the largest individual consumer of copper in the world, and, it is understood, has been for some time consuming copper at the rate of 7000 tons monthly, or between 160,000,000 and 170,000,000 lb. a year. In Europe the nearest approach to this total has thus far been in the neighborhood of 70,000,000 lb. consumed by the Allgemeine Elektrizitäts Gesellschaft of Germany, the greatest consumer abroad. Included in the American Brass Company's total must be considered large tonnages ordinarily credited to the General Electric, Westinghouse and other leading consumers, for they use copper in finished form to a large extent which has been prepared for them by the first-named company.

Metal Market

NEW YORK, August 21, 1912.

The Week's Prices

		Cents Per Pound for Early Delivery.						Spelter	
Copper, New York.		Electro-lytic.	Tin.	Lead		New York.	St. Louis.	New York.	St. Louis.
Aug.	Lake.			New York.	St. Louis.				
15.....	17.70	17.62½	45.65	4.50	4.35	7.10	6.95		
16.....	17.70	17.62½	45.70	4.50	4.35	7.00	6.85		
17.....	17.70	17.62½	.....	4.50	4.37½	7.00	6.85		
19.....	17.65	17.60	45.95	4.50	4.40	7.05	6.90		
20.....	17.65	17.60	46.50	4.50	4.40	7.10	6.95		
21.....	17.65	17.60	46.20	4.50	4.40	7.10	6.95		

Copper is quiet but strong. In tin there has been a fair business and prices are higher here and abroad. Lead has a firmer tone and higher prices are quoted by independents. Spelter weakened slightly but has again strengthened. Antimony is unchanged.

New York

Copper.—Following a good business, which was done quietly in the early part of last week, slower conditions have prevailed in the copper market, but it is by no means devoid of activity. While the producers adhere to their price of 17.75c., 30 days, for electrolytic and 17.75c. cash for Lake, sellers of outside lots established lower prices. A quantity of Lake was sold this week at 17.65c. cash, New York, and other lots were offered at the same price. Relatively, electrolytic is stronger than Lake and 17.60c. cash, New York, is a fair market price for the former. A sale of what may be termed an odd lot of copper is reported to have taken place this week at 17.20c., but it is almost a surety that no more can be found at this figure. A carload of casting copper was offered yesterday at 17.37½c. cash, New York. Although domestic consumption was never better, consumers are unquestionably playing a waiting game which is evidenced by their purchases for August and September at a premium. The exports of copper were on a comparatively small scale up to last week, when there was a decided improvement which brought the month's total up to 14,738 tons. The London market was quoted this morning at £79 7s. 6d., an advance of 10s. over yesterday. Futures are quoted at £79 5s.

Pig Tin.—Up to the end of last week tin was quiet, but a little activity started on Monday last when the trade, particularly in the open market, was stimulated by the sale of 150 tons on the New York Metal Exchange. On that day 75 tons of August sold from 45.95 to 45.85c., 50 tons of October at 45.50c. and 25 tons of November at 45.25c. The feature of the week was an advance in London yesterday of £3 2s. 6d., which, however, was followed to-day by a decline of £1 10s. as reported by the first cable. The high price of yesterday brought out a large quantity of tin which had been in the hands of speculators on which they sought to realize, and this served to prevent the New York market from fully responding to the London advance. No definite reasons are given for the advance abroad, although it caused reports that the tin situation was again in the hands of a London syndicate. Prominent operators here would not attempt to ascribe a reason. The market in London this morning was quoted at £210 for spot and £208 for futures. The New York price this morning was 46.20c. The arrivals of tin this month were 3606 tons and there is afloat 1755 tons.

Tin Plates.—There is an increasing demand for tin plate. With almost the entire producing capacity of the country busy and some of the canners in dire need for plate, the situation is one which has redounded to the benefit of many of the jobbers who have received telegrams urging that they immediately make known what quantities they can supply. Of course the jobbers demand a substantial premium for the depletion of their stocks.

Lead.—Not much can be said of lead except that the metal has a much firmer tone; that independents have advanced their prices, and that both sellers and producers have faith in the nearness of still higher prices. There is no great amount of activity at the prices quoted which are 4.50c. New York, and 4.40c., St. Louis.

Spelter.—Since the latter part of last week spelter has strengthened and is quoted to-day at 7.10c., New York, and 6.95c., St. Louis. Last Saturday it was quoted at 6.85c. to 6.90c., St. Louis, and 7c. to 7.05c., New York. The smelters are reported to be well filled with orders. A producer is reported to have made heavy sales for October delivery at 7.05c., New York.

Antimony.—In a dull market there have been no changes in the prices of antimony, which is quoted as follows: Cookson's, 8.60c.; Hallet's at 7.87½c. and Chinese and Hungarian brands at 7.75c.

Old Metals.—The market is quiet. Dealers' selling quotations are fairly firm, as follows:

	Cents per lb.
Copper, heavy and crucible	16.00 to 16.25
Copper, heavy and wire	15.50 to 15.75
Copper, light and bottoms	14.00 to 14.25
Brass, heavy	10.00 to 10.25
Brass, light	8.25 to 8.50
Heavy machine composition	13.00 to 13.25
Clean brass turnings	9.50 to 9.75
Composition turnings	12.00 to 12.50
Lead, heavy	4.40
Lead, tea	4.15
Zinc, scrap	5.50

Chicago

AUGUST 20.—The market transactions of the past week in carloads have shown a well maintained firmness in tin, lead and spelter. Copper quotations, while unchanged, show indications of possibly lower prices, but thus far producers have maintained their schedules with considerable firmness. The trade in old metals has been very dull and quotations are unchanged from a week ago. We quote as follows: Casting copper, 17.50c.; Lake, 17.75c. to 17.87½c., in carloads for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, carloads, 46.75c.; small lots, 48.75c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.70c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 7.10c. to 7.20c.; Cookson's antimony, 9c., and other grades, 8.50c. in small lots; sheet zinc is \$8.75 f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 14.75c.; copper bottoms, 13c.; copper clips, 14c.; red brass, 12c.; yellow brass, 9.25c.; lead pipe, 4c.; zinc, 5c.; pewter, No. 1, 28.50c.; tinfoil, 33c.; block tin pipe, 40c.

St. Louis

AUGUST 19.—The metal market has been quiet the past week with lead a little better, being quotable today at 4.35c. to 4.40c. Spelter is held at 6.80c. to 6.90c., according to delivery. In other metals quietness prevails, the figures generally following the New York quotations closely. Tin is quoted at 46.10c. to 46.60c.; Lake copper, 17.72½c. to 18.10c.; electrolytic copper, 17.62½c. to 18c.; Cookson's antimony, 8.95c. In the Joplin ore market, although zinc blende was about \$7 per ton below what it was three weeks ago it was still at the 1905 record, which was the highest until the recent figures were made. The basis range for 60 per cent. was \$52 to \$5., with choice lots bringing as high as \$60. Calamine was in excellent demand at \$27 on the 40 per cent. basis, with the choice lots fetching as high as \$36. Lead ore was in lighter demand at \$55 to \$56 on the 80 per cent. basis, with the choicer lots bringing \$57. On miscellaneous scrap metals we quote as follows: Light brass, 5.50c.; heavy brass and light copper, 9.50c.; heavy copper and copper wire, 10.50c.; pewter, 21c.; tinfoil, 31c.; zinc, 3.50c.; lead, 3c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, August 21, 1912.

Industrial securities have received a more than usual share of attention on the New York Stock Exchange in the past few days. The continuance of excellent reports from the iron trade, the buying of more equipment by railroads and the splendid crop reports have combined to divert attention to the expectation of increased earnings by manufacturing corporations, with a resultant rise in prices. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Bald. Loco., com... 57½-59½	Pressed Steel, pref... 103-103½
Bald. Loco., pref... 105½-106½	Railway Spring, com. 37-38½
Beth. Steel, com... 38-42½	Railway Spring, pref. 103½-104
Beth. Steel, pref... 71½-73½	Republic, com... 27½-28½
Can, com... 40½-41½	Republic, pref... 89½-91½
Can, pref... 119½-120	Sloss, com... 56-59
Car & Fdry., com... 60½-61½	Pipe, com... 19-20
Car & Fdry., pref... 118-118½	Pipe, pref... 58½-59½
Steel Foundries... 35½-36½	U. S. Steel, com... 72½-74½
Colorado Fuel... 31½-32½	U. S. Steel, pref... 113-113½
General Electric... 182-183½	Westinghouse Elec... 86½-89
Gr. N. Ore Cert... 44½-47½	Va. I. C. & Coke... 63-64
Int. Harv., com... 121½-123½	Am. Ship, com... 45-46
Int. Pump, com... 27-28½	Am. Ship, pref... 102½-104
Int. Pump, pref... 80-81	Chic. Pneu. Tool... 50½-52
Lackawanna, Steel... 40-43	Cambria Steel... 44½-44¾
Locomotive, com... 45-46½	Lake Sup. Corp... 33-34
Locomotive, pref... 109-110½	Pa. Steel, pref... 99
Nat. En. & St., com. 16½-19½	Warwick... 10½-10½
Nat. En. & St., pref... 93	Crucible Steel, com... 17½-18½
Pittsburgh St., pref. 102½-104½	Crucible Steel, pref... 96½-97½
Pressed Steel, com... 37½-38½	Harb. Wk. Ref., pref... 100½

The printed statement that the Crucible Steel Company of America, Pittsburgh, is guaranteeing the bonds of the Norwalk Steel Company, Norwalk, Ohio, has led to some confusion and is incorrect. The Crucible Company is sim-

ply guaranteeing the interest on these bonds and not the principal.

Dividends Declared

The General Electric Company, regular quarterly, 2 per cent., payable October 15.

The Harbison-Walker Refractories Company, regular quarterly, one-half of one per cent. on the common stock, payable September 2.

The National Enameling & Stamping Company, regular quarterly, 1¼ per cent., on the preferred stock, payable September 30.

The Studebaker Corporation, regular quarterly, 1¼ per cent., on the preferred stock, payable September 3.

Deere & Co., regular quarterly, 1¼ per cent. on the preferred stock, payable September 1.

Personal

W. E. Corey returned to New York August 17 after a stay of several months in Europe. In an interview he referred to the remarkable volume of domestic business in iron and steel in this Presidential year and to the fact that business abroad is excellent, with steel prices there on a par with those at home and foreign mills filled to their capacity.

E. S. Wortham, formerly purchasing agent of the Chicago & Alton Railroad, has been appointed manager of purchases and supplies, with offices in the Railway Exchange Building, Chicago. The position of purchasing agent has been discontinued.

Wm. L. Minick has resigned as secretary of the Geiser Mfg. Company, Waynesboro, Pa. This company was recently absorbed by the Emerson-Brantingham Company, Rockford, Ill.

Eugene L. Zimmerman, of Cincinnati, who was recently elected president of the Wellston Iron & Steel Company, Wellston, Ohio, succeeding the late Maurice L. Sternberger, has resigned and has disposed of his holdings in that company to Harry S. Willard, of Wellston, and Maurice L. Sternberger, Jr., of Jackson, Ohio. With the change of ownership of the stock a new organization was effected, H. S. Willard becoming president and Maurice L. Sternberger, Jr., vice-president and general manager. The improvements now under way at the three plants of the company will be rushed to completion.

A. D. Davis has resigned as district sales manager for the Cambria Steel Company at Buffalo, N. Y. He has held this position for several years, having been transferred to Buffalo from the general office at Johnstown, about four years ago, as assistant district sales manager. His successor has not as yet been designated.

Ralph H. Thatcher will resign his position September 1 as general sales agent of the Paige Woven Wire Fence Company, Monessen, Pa., to become secretary and treasurer of the Springfield Spring Company, Springfield, Ohio.

Isaac M. Scott, for some years president of the LaBelle Iron Works, Steubenville, Ohio, will resign in the near future to become president and active in the management of the recently organized Wheeling Sheet & Tin Plate Company, which will build a 10-mill tin plate plant near Wheeling.

H. H. McClintic, of the McClintic-Marshall Construction Company, Pittsburgh, has gone to Panama, where his company is doing a large amount of work.

David Baker, of Philadelphia, has gone to Australia to act as advisor to the Broken Hill Proprietary Company, in relation to the large iron and steel works to be erected at Newcastle, N. S. W., by that company.

E. Gybbon Spilsbury, of New York, consulting engineer of the Southwestern Steel Corporation, is on a visit of inspection to the company's iron-ore properties in Texas.

Frederick J. Mayer, general manager of the Didier-March Company, 30 Church street, New York, which has built the new by-product coke plant at South Bethlehem, Pa., returns to New York from Europe this week.

Alex. P. Robinson, vice-president of the Cambria Steel Company, has been elected a director of the company, succeeding Fred. Krebs.

Adolph O. Krieger has resigned as publicity manager of the Busch-Sulzer Bros.-Diesel Engine Company, St. Louis, with which he has been connected for a number

of years, to open an office at 916 Victoria Building, St. Louis, for the sale of the new Tacchella oil burning device, which is especially suitable for domestic heating and cooking purposes, japanning and annealing ovens, and baking ovens.

Samuel Hale has resigned as vice-president and general manager of the Wisconsin Steel Company, Chicago, to become general manager of the Algoma Steel Corporation, Sault Ste. Marie, Canada. The Algoma Steel Corporation was recently organized as a combination of several subsidiaries of the Lake Superior Corporation.

Arthur Redner has entered upon his duties as underground superintendent of the Steel Corporation's Aurora mine at Ironwood, Mich., to which post he was recently appointed. He succeeds Capt. Thomas B. McNamara, who resigned to assume charge of the extensive royalty interests of John M. Longyear of Marquette and the Keweenaw Association on the Gogebic range.

Charles Vickers, editor of the non-ferrous casting department of the Foundry, has resigned to take charge of the introduction of copper-titanium for the Titanium Alloy Mfg. Company, Niagara Falls, N. Y.

Obituary

Edward H. Hargrave

Edward H. Hargrave, president Cincinnati Tool Company, Norwood, Cincinnati, Ohio, died suddenly at his home in that city August 15, aged 60 years. He was born in Cincinnati and acquired his first business experience with the James L. Haven Company, holding the position of secretary for a number of years. About 30 years ago he bought an interest in the Cincinnati Tool Company, and was its president until his death.

Mr. Hargrave was an extensive traveler, and was one of the few American manufacturers considered an authority on export matters. In his numerous business trips abroad he visited Europe, Australia, Japan, Central America and South America, and by persistent, well-directed efforts had built up an excellent export trade all over the world. About eight years ago, when on a visit to Paraguay, he was honored by the president of that country



EDWARD H. HARGRAVE

with the appointment of vice-consul at Cincinnati. He was a prominent member of the Cincinnati Business Men's Club, Cincinnati Commercial Association, National Metal Trades Association and other business organizations. He leaves a widow, two sons and a daughter.

SAMUEL CHAMBERLAIN COBB, Janesville, Wis., died August 10, aged 76 years. He was born in Albany, Vt., and located in Janesville in 1856, where he entered the

Budd Novelty Works, remaining until 1866, when he became connected with the Harris-Fifield Company as a member of the board of directors. He was one of the founders of the Harris Mfg. Company, of which he was a director. In 1881 the Janesville Machine Company succeeded the Harris Company, and Mr. Cobb was made superintendent, continuing as a director also. He became purchasing agent in 1894 and served in that capacity until about a year ago, when he retired. He was also a director of the First National Bank of Janesville. He was a veteran of the Civil War, rising to the rank of major. He was prominent in local affairs, having held the positions of alderman and mayor. He leaves a widow and a daughter.

WILLIAM E. DREW, head of the Drew Machinery Agency, Manchester, N. H., died August 1, aged 63 years. He was born in Manchester. Learning the trade of machinist, he became an expert. In 1872 he was admitted to partnership with S. C. Forsaith, in whose shop he had learned his trade. The Drew Machinery Agency was founded in 1890 by Mr. Drew and W. H. Wheeler, who at that time left the Forsaith Machine Company, and a year later they bought up the stock of that company, which practically made a continuance of the business. Mr. Wheeler and Mr. Drew had been associated for thirty-two years. Mr. Drew leaves a widow and a daughter.

FRANK J. MULCAHY, vice-president and general manager of the Crane Valve Company, Bridgeport, Conn., died August 19, following an operation for appendicitis, aged 59 years. He was a native of Cleveland, Ohio.

SENECA D. KIMBARK, for many years a heavy hardware merchant in Chicago, died there August 14, aged 81 years. He went to Chicago 54 years ago.

Lake Superior Mining Institute, 1912 Meeting

A partial list of papers to be read at the seventeenth annual meeting of the Lake Superior Mining Institute has been sent out by the secretary, A. J. Yungbluth, Ishpeming, Mich. The meeting will be held in the copper country August 28, 29 and 30, and the headquarters will be at the Douglas House, Houghton, Mich. A number of papers relate to copper mining. Those which have been prepared by persons connected with iron mining are the following:

"Notes of Methods of Mining Iron Ore in the Lake Superior District," by F. W. Sperr, Houghton, Mich.

"Balancing Rock Crushers," by O. P. Hood, Pittsburgh.

"Methods of Sampling at Lake Superior Iron Mines," by Benedict Crowell, Cleveland, Ohio.

"System of Safety Inspection of the Cleveland-Cliffs Iron Company," by William Conibear, Ishpeming, Mich.

"Raising Shaft at Rolling Mill Mine, Negaunee, Mich." by Edwin N. Cory, Negaunee, Mich.

"Mine Sanitation," by E. B. Wilson, Scranton, Pa.

"Raising, Sinking and Concreting No. 3 Shaft, Negaunee Mine," by S. R. Elliott, Negaunee, Mich.

About six months ago a boat carrying some 4000 tons of fabricated steel shipped by the McClintic-Marshall Construction Company, Pittsburgh, to the Panama Canal went down off the Bahamas. The vessel was raised by wreckers and arrived in New York harbor a few days ago with about 1000 tons of the steel on board. The original cargo of 4000 tons was insured, and the 1000 tons now in the New York harbor is the property of the insurance company, and what disposition it will make of the steel is a matter of some conjecture.

Members of the executive, press, revision of by-laws and necrology committees of the Empire State Implement Men's Club have been called to meet at the Onondaga Hotel in Syracuse on the evening of September 12, at eight o'clock. President C. E. Pierce, Geneva, N. Y., who has called the meeting, says it will be a most important one, as arrangements are to be made for the twelfth annual meeting of the club at Lockport February 21 and 22, 1913. Lockport has already made plans to give the club a most hospitable reception.

The Canadian Car & Foundry Company, Montreal, has received from the Canadian Pacific Railway Company an order for 7000 steel box cars to be delivered during the first half of next year.

Pittsburgh and Vicinity Business Notes

A printed statement that the Washington Tin Plate Company, Washington, Pa., had increased its indebtedness from \$129,000 to \$400,000 is misleading. The fact is that this company has recently increased its bonded indebtedness from \$200,000 to \$400,000, the increase being used for the purpose of making large additions to the plant, which were completed some time ago. These included two hot tin mills, four cold mills, a tinning house, additional boiler capacity and other equipment. The plant is now in operation to full capacity.

The shops of the Pennsylvania Railroad at Verona, Pa., are running full force for the first time in several years.

The Ellwood City Forge Company, Ellwood City, Pa., has begun work on enlargements which include the extension of one of the main buildings 100 ft. and the construction of a new building 40 x 50 ft. The company is also adding considerable new equipment, including a 6000-lb. hammer and a number of lathes. It finds connecting rods and crank shafts in heavy demand.

The Charleroi Water Company has awarded a contract for a 2,000,000 gal. addition to the filter plant at Charleroi, Pa., to the Roberts Filter Mfg. Company, Darby, Philadelphia. Chester & Fleming, Pittsburgh, are the consulting engineers. Extensive improvements will also be made to the pumping station.

A. M. Byers & Co., Inc., Pittsburgh, maker of iron pipe and tubing, has increased its capital stock from \$1,000,000 to \$1,200,000, but states that no important improvements or extensions are under way at this time. The company operates a Mattie furnace at Girard, Ohio, under the name of the Girard Iron Company, and also has large puddling plant and skelp mills at Girard, the skelp being shipped to its Pittsburgh mills where it is made into pipe.

S. Diescher & Sons, Farmers' Bank Building, Pittsburgh, are the consulting engineers for the erection of the new tin plate plant of the Wheeling Sheet & Tin Plate Company, which will probably be built on the Ohio side of the river between Steubenville and Wheeling, W. Va. The main building will be of steel, and will contain 10 hot tin mills, 12 cold mills and a bar shed. The engine will be of the Corliss type, 32 by 60 in., with rope drive for the hot mills and gear drive for the cold mills. The tin house will contain 18 tinning sets and the plant will be equipped with one 5-ton and four 20-ton electric traveling cranes, and 2500-hp. water-tube boilers. The Fort Pitt Bridge Works, Pittsburgh, has the contract for the building, requiring about 1200 tons of steel.

The United Engineering & Foundry Company, Pittsburgh, is building a 20-in. bar mill for rolling rounds and a 9-in. small finishing mill for the C. Pardee Works, Perth Amboy, N. J., and will soon have ready for shipment a 90-in. plate mill for the Inland Steel Company, Chicago, and a 34-in. blooming mill and an 18-in. Morgan continuous mill with all accessories for the Steel Company of Canada, Hamilton, Ont.

The American Vanadium Company, 332 Vanadium Building, Pittsburgh, supplier of pure vanadium, has drawn plans for a new plant at Bridgeville, Pa., which will treble the capacity of its present plant at that place. Bids will be asked for in a short time on the erection of the buildings and on a large amount of new equipment that is to be installed.

The Commonwealth of Pennsylvania has employed Chester & Fleming, hydraulic engineers, Pittsburgh, to prepare complete plans and specifications for a 1,000,000 gal. electric driven pump station for the water supply of the State Institution for Feeble Minded at Polk, Venango County, Pa. Proposals on this work will be received in September.

At the annual meeting of the American Fork & Hoe Company, Cleveland, August 13 all the retiring directors were re-elected. President W. H. Cowdrey was given the additional duties of treasurer in place of T. H. Withington, resigned.

Furnace A of the Central group of the American Steel & Wire Company, at Cleveland, Ohio, has been blown in after relining.

The World's Production of Pig Iron

James Watson & Co., Glasgow, Scotland, have published their annual statement of pig iron production for the world. The figures, which are given below, represent gross tons for the United States, Great Britain and Canada, and presumably metric tons of 2204 lb. for most if not all other countries:

Countries.	1911. Tons.	1910. Tons.	1909. Tons.
United States	23,649,344	27,298,545	25,795,471
Germany	15,535,112	14,793,325	12,917,653
Great Britain	9,718,638	10,216,745	9,664,287
France	4,508,022	4,032,459	3,544,638
Russia	3,521,000	*2,956,000	*2,817,000
Austria and Hungary	2,089,867	1,990,684	1,947,300
Belgium	2,072,843	1,803,500	1,632,350
Sweden	633,800	604,300	443,000
Spain	435,000	425,000	420,000
Canada	824,345	740,210	677,090
Italy	253,322	343,600	147,000
Japan	*162,000	*162,000	*161,020
India	49,183	35,933	39,350
China	110,000	120,000	74,000
Mexico	70,096	45,000	58,859
New South Wales	36,354	40,487	26,762
Total	63,668,926	65,607,788	60,365,780

*Estimated.

The total for 1911 shows a decrease of 1,938,862 tons from that of 1910, but an increase of 3,303,146 tons over that of 1909.

Mesta Machine Company Products

The Mesta Machine Company, Pittsburgh, works at West Homestead, Pa., has issued a most attractive illustrated pamphlet of 50 pages, describing the plant and the principal products. It is stated that the plant covers about 20 acres and has about 500,000 sq. ft. of floor space under roof and over 400,000 sq. ft. covered by electric traveling cranes. Views are given of the main aisle in the machine department, which is 1000 ft. in length; also of the central erecting floor in the machine shop and of other parts of the plant. The products of the company are machinery for steel works, blast furnaces and power plants, consisting of gas and steam engines, barometric condensers, air compressors, steam-hydraulic quick acting forging and bending presses, rolling mill machinery, iron and steel rolls and pinions, machine molded gears and cut gears made of iron or steel. Illustrations are given of some of the largest work turned out by the company for various iron and steel works in the United States, Canada, Japan and other countries:

Pittsburgh Meeting of the American Iron and Steel Institute

Arrangements that are under way for the October meeting of the American Iron and Steel Institute at Pittsburgh indicate that the pronounced success of the meeting in New York in May will be repeated, and even exceeded. A particularly strong programme of papers is promised dealing with steel metallurgy, rolling mill practice and the commercial side of the steel industry. The same plan will be followed which was so satisfactory at the New York meeting—a division of the programme between commercial and technical questions.

The Titanium Alloy Mfg. Company, Pittsburg, Pa., shipped 3,836,818 lb. of titanium alloy to various steel manufacturers in 1911. Of this total, 1,854,218 lb. went to makers of open-hearth and crucible steel and 1,982,600 lb. to makers of Bessemer steel. This alloy is used in amounts varying from 0.2 to 0.6 per cent. in the treatment of steel. Taking 0.4 per cent. as the average thus used, the amount shipped in 1911 would be sufficient to treat 428,216 gross tons of steel.

The Walter A. Zelnicker Supply Company, St. Louis, Mo., announces that, in addition to its line of new and second-hand railroad rolling stock and tools, it is making a specialty of all sizes of new and second-hand storage tanks.

The Sloss-Sheffield Steel & Iron Company will blow in its reconstructed Hattie Ensley furnace at Sheffield, Ala., this month.

Last week the American Steel & Wire Company advanced prices on triangular mesh reinforcement \$1 a ton.

The Detection of Oil in Water

The detection of oil in water is a difficult matter, especially when the oil is present as emulsion, a subject which is little understood by many engineers. The accomplishment of this purpose is steadily growing more important with the increase in general practice of utilizing the condensate from exhaust steam heating and drying systems, surface condensers, absorption, ice machines, etc., and also to heat water by direct contact with exhaust steam in open feed water heaters. Greater economy is also sought in utilizing various water supplies such as the water employed for cooling bearings, etc. These practices often make it a difficult matter when oil appears in boilers to say from what source it has come.

Considerable interest attaches to an instrument for oily emulsion which is known as the Martin test tube and is sold in the United States by the Harrison Safety Boiler Works, North Philadelphia Station, Philadelphia, Pa., manufacturer of the well-known Cochrane open feed water heaters, steam and oil separators and the Sörge-Cochrane hot process water softening systems. This instrument is a long test tube made of clear glass except at the bottom, which is opalescent or milky, with a small black dot in the center. The manner of using this instrument is to collect in a glass or cup a sample of the condensate to be tested and then taking the tube to a good light from a north exposure pour the water slowly into the tube until the black dot just disappears from view. The graduation on the tube which is then opposite the level of the water in the tube will show the amount of oil in emulsion in grains per gallon. The results obtained by these tubes have been repeatedly compared with analyses made by the chemists of the Harrison Safety Boiler Works and the tube is reported to be substantially correct.

British Foreign Trade In Iron and Steel

In spite of the coal strike, Great Britain's iron and steel exports for the first seven months of this year were 2,678,062 tons, valued at £25,727,345, or 92,168 tons more than to July 31, 1911. Pig iron exports were 756,308 tons, against 663,647 tons. In July the total iron and steel exports were 424,374 tons, against 311,399 tons in July, 1911. Pig iron exports in July were 110,675 tons, while in July last year they were 70,530 tons, the amounts sent to Germany and the United States last month showing marked improvement, due in the case of the United States to the increase in ferromanganese. Of British imports of iron and steel the total was 180,661 tons last month, or nearly a 50 per cent. increase over the total of 124,981 tons in July, 1911. For seven months the imports this year were 1,069,334 tons, against 1,026,750 tons, values being £6,878,122 and £6,501,659, respectively.

Natural Gas and Its Measurement.—Engineering Bulletin No. 2 recently issued by the University Engineering Experiment Station, of the University of Kansas, Lawrence, Kan., is entitled, "Natural Gas: its Properties, its Domestic Use and its Measurement by Meters." It is a report prepared by P. F. Walker, professor of mechanical engineering at the University for the Public Utilities Commission of that State. The investigation was undertaken with a view to ascertaining the effect of pressure changes on the value of gas and upon the accuracy of meters employed, but at the conclusion of the work it was found that pressure difference had very little to do with the subject. One of the interesting points brought out in the research was the effect of varying rates of flow upon the behavior of the different meters.

Tropical climates generally offer the greatest difficulties to motor trucks on account of the soft soil. It is therefore gratifying to hear that an American truck, the KisselKar, built by the Kissel Motor Car Company, Hartford, Wis., is performing a highly satisfactory service in Jamaica. It is a 3-ton model and is used by Goffe Bros., exporters of bananas. This truck is frequently called upon to negotiate 20 per cent. grades and to make a route that no other truck in the island will attempt.

The Steel Tenon Mfg. Company, 201 Continental Building, Denver, Col., is opening a Chicago office at 131 North Market street.

New Publication

Price Changes in the Mining Industry Since 1870. (Preisentwicklung in der Montan Industrie Seit 1870.)

By Emil Mussig, Augsburg, Germany.

This interesting book has just come from the German press and is worth the attention of practical steel and iron men as well as of political economists. It deals exhaustively with the fluctuations in prices of coal, coke, iron ore, pig iron, ingots, bars, structural shapes, etc., from 1870 to the spring of 1912, showing the periods of greatest advances and declines in each case and the causes therefor. The author deals principally with conditions as they existed in Germany in the past 42 years; yet he also shows not only how the various years of full and ebb tide are nearly identical for the above metals and raw materials, but calls attention to the fact that these years of high and low prices find generally corresponding conditions in England and America, modified to some extent by special causes. Nevertheless the apparent worldwide sympathy in these fluctuations is striking. In the period from 1870 to 1910 the author finds the following years conspicuous in Germany:

Years of high prices—1872, 1880, 1890, 1900, 1906.

Years of low prices—1879, 1886, 1895, 1901, 1908.

The various causes of the price changes, whether political, economic or otherwise, are explained, and detailed tables of market prices for each of the 42 years are given to illustrate his argument. For example, in 1872-3 culminated the over-speculation and over-production resulting from over-confidence in the early years of the founding of the German Empire. In 1879 the low tide was reached, when a duty was placed on some iron and steel products. About this time also was introduced the Thomas process, which revolutionized steel conditions in Germany. But the great expansion of railroad building in America at this time was responsible for the worldwide upward swing in prices and prosperity. The low ebb of 1886 is remarked upon as in line with stagnation of business in America, which had an international influence also. And thus the writer goes on.

One of the most interesting things in the book is the author's endeavor to show that the price fluctuations since 1893 have been much less violent and erratic because of the formation of business combinations or "trusts" which have brought a stability in markets which has prevented extremes in prices. This the author shows by charts and tables in the case of practically all the materials enumerated, and he argues that such a state of affairs is far better than alternations of wild speculation and sharp competition, with resulting crashes and depressions. To quote: "Combinations prevent a high or low price panic. Therefore, the damage from a politico-economic standpoint, of unrestrained competition, is now recognized and people are regarding 'trusts' differently. We take a different stand from that of America, where the Government is now sharply prosecuting these syndicates. One cannot say in general that these combinations elevate prices unrestrainedly, because sooner or later they are compelled to adapt themselves to economic conditions."

The author emphasizes the effect on price fluctuations of the modern technical advances, stating that improved methods are working hand in hand with business combinations to steady prices and cheapen operations. He also shows how these two factors have had not only a steadying effect, but have also brought about a marked lessening of the gap between high and low prices in the last 40 years. The point is also illustrated in a table showing the fluctuations of discount rates in the German and English banks during these high and low periods. The effect of workmen's beneficial laws is touched upon, as is also the steadying influence of the German tariffs. The advantage of nearness of works to ocean ports, facilitating shipments of iron and steel in the case of both Germany and England, is cited as against the great distance of most of our large producers from the ocean.

The book is replete with interesting comparative tables. There is also a large chart, published separately, which shows all the fluctuations by plotted curves. E. F. C.

The E. F. Casey Brass & Aluminum Foundry announces the opening of a new foundry at 559 West Van Buren street, Chicago. E. F. Casey is the proprietor.

The Titanic's Steel Plates

A Suggestion of Brittle Steel Which Professor Howe Holds Is Not Borne Out

Brittle ship plates are charged by Ch. Fremont, in *La Technique Moderne*, Paris, France, July 1, with the dire consequences of the Titanic disaster. The article also presents the possibility that the plates were cut open as the result of a rubbing action of the vessel against the iceberg rather than by impact more or less direct. It appears that the French submarine *Pluviôse*, which was sunk May 26, 1910, received a shock on its bow portion while its hull was scraped or rubbed by the keel of the other of the colliding boats. The plates forming the hooded bow, it is explained, had to be of good quality to submit to the considerable work necessary to develop its shape. Though receiving a violent shock, these plates were merely dented without rupture. The plates of the hull, however, had been opened almost without deformation by the tangential rubbing of the keel. These plates, Mr. Fremont adds, were brittle, "a piece shown in the windows of the newspaper *Le Matin* leaving no doubt in this regard." The loss of the *Vendémiaire* is also, he claims, attributable to the scraping of the keel of the *St. Louis* against plates of excessive brittleness.

As regards the Titanic, Mr. Fremont considers there could only have been a rubbing action against the iceberg, else how could passengers have remained playing their card games if there had been a shock such as would certainly have resulted from abruptly absorbing the extremely high speed of 21 knots per hour? He has also translated the meager descriptions of what occurred to mean that the plates were cut open along the lines of riveting, the ruptures arising in the areas impaired by the punching around each rivet. He concludes that it is necessary to demand for ship plates a higher quality than is now the case and that they must be subjected to tests capable of disclosing future brittleness instead of the less exacting method accepted by the Congress of Copenhagen.

Comments by Professor Howe

Prof. Henry M. Howe, referring to the article in *Technique Moderne* has written, in part, as follows:

"The fact that the shock was not felt as a severe one by the passengers must be taken with a good deal of caution. We must remember that between the point of impact and the passengers there was a very great length of hull and decks, all of which would act like a spring to lessen the shock and deaden it before it actually reached the passengers. The vessel itself may be regarded as a colossal spring. A blow locally sufficient to tear the plates open along the rivets might be so far reduced in intensity by the time it reached the passengers as to be very mild. For that matter, the report which Mr. Andrews made of his inspection of the Titanic does not seem in any way to indicate what the nature of the damage was, or that it was due to brittleness. Much less does it indicate that such brittleness would have been detected by the drop test, even if it had failed to be detected by the usual tensile test."

Minnesota Steel Company Places Order for Mills

The contract for the mill equipment for the Minnesota Steel Company's plant at Duluth has been awarded to the Allis-Chalmers Company, Milwaukee. The mills include one 40-in. reversing blooming train, one 28-in. finishing and one 18-in. continuous roughing, with three stands of 12-in., two stands of 10-in., and two stands of 8-in. finishing rolls. The contract includes also a 40 and 66 x 60 in. twin tandem reversing engine, and four twin tandem gas engine units with direct connected alternating current generators, each developing 3000 kw. The 28-in. rail mill equipment includes the manipulator and all gearing. Delivery is expected to be made in from eight months to a year.

The Cleveland Machine & Mfg. Company, Cleveland, Ohio, has taken a contract from the Minnesota Steel Company, Duluth, Minn., for a 16-in. continuous mill. The same company has also been given a contract by the Lackawanna Steel Company for two 100-ton open-hearth furnaces.

Large British Contract for Bridges in India

A Darlington, Eng., correspondent of the London Financial Times gives the following account of "the largest individual bridge contract placed in Great Britain since that for the Forth bridge," there being competition from Belgian and German firms and the American Bridge Company:

The contract comprises the whole of the steel work required in the new railroad and road bridge which is being built to carry the Eastern Bengal State Railway over the Lower Ganges between Damukdea, 120 miles from Calcutta, and Sara Ghat. Traffic has hitherto been conducted between these places by means of steam paddle ferries. The bridge, exclusive of approaches, will consist of 15 main spans, each 359 ft. in length and 52 ft. in depth at center and weighing 1300 tons. There will be provision for a double broad gauge track and also a footway carried upon cantilevers outside the main girders. The foundations for the masonry piers upon which the 15 spans will rest are to be carried 150 ft. below the bed of the Ganges in order to guard against the deep scour of the river. Early completion was an important feature in the award of the contract, which has been divided between Braithwaite & Kirk, Ltd., of West Bromwich, who are to supply six of the spans, and the Cleveland Bridge and Engineering Company, Ltd., of Darlington, which has the order for nine spans, the first of these to be shipped to the site before the end of the year. The work is being carried out to the designs of Sir Alexander Rendel, consulting engineer to the India office, and the scheme will involve the expenditure of \$5,500,000.

The New Republic Mills

The management of the Republic Iron & Steel Company, Youngstown, Ohio, has definitely decided on the sizes of the mills which will replace the obsolete ones to be dismantled at the Brown-Bonnell works of the company. The new department will consist of four trains of rolls, comprising 8, 12, 16 and 20 in. mills. The new mills will be equipped with continuous furnaces and modern labor-saving machinery and will be served with electric cranes, the contract for which has been placed with the Morgan Engineering Company, Alliance, Ohio. They will be housed under one roof, the building being 780 ft. in length by 140 ft. in width. The contract for the new building has been awarded to the McClintic-Marshall Construction Company, Pittsburgh, and the work of erecting it will begin about September 15. Fourteen hundred tons of structural steel will be used in the building.

The Impervious Sheet Steel Company

The above-named company, located at Pittsburgh, and of which Charles E. Pope is president, has bought about seven acres of ground at Rochester, Pa., and will erect a plant for the manufacture of coated steel sheets. The sheets will be treated by a process owned by the company, and fully protected by patents, by which they are said to become absolutely impervious to moisture, acids or corrosion from any cause. The company will buy its sheets in the open market, and at the start will have a daily capacity of about 20 tons, which later will probably be increased. A considerable amount of new equipment will be installed, including a pickling machine of the Mesta type. The company expects to have the plant in operation in from 60 to 90 days. H. M. Easton, now assistant manager of sales of the Phillips Sheet & Tin Plate Company, Weirton, W. Va., will, on October 1, become sales manager of the Impervious Sheet Steel Company.

The Morgantown Chamber of Commerce, Morgantown, W. Va., received its certificate of incorporation August 3. The stockholders met August 12 and elected as directors Dr. I. C. White, Glenn Hunter, J. W. Wiles, J. Ami Martin and Dr. C. H. Maxwell. Dr. White is State Geologist and is Morgantown's leading citizen; Mr. Hunter is an attorney, Mr. Wiles handles real estate, Mr. Martin is a builder of railroads and trolley lines, and Dr. Maxwell is a physician. The directors elected officers as follows: President, Dr. I. C. White; vice-president, J. W. Wiles; secretary-treasurer, Glenn Hunter. The offices are at 403 Price Building. An active campaign for new industries is now being conducted.

The Machinery Markets

A survey of the machinery trade of the country makes it clear that the industry is doing exceptionally well for August. While some territories show a temporary decline in activity no complaint is heard as it is recognized even in these localities that trade is above the average for the hot months, and the prospects everywhere are good. Manufacturers have enough orders coming in from busy districts to more than offset the slackened activity in others not so busy and early deliveries are not always easily made. New York has experienced a rather quiet week, but inquiries are good and the trade is looking ahead with confidence. There is an increasing demand on New England producers, stocks are decreasing and difficulties in early deliveries are predicted. The Philadelphia trade has been irregular. A feature of the Pittsburgh market is a large list issued by the National Car Company, Ltd., Hamilton, Ont., and another is that manufacturers of that city are shipping large quantities of steel products to Canada. The Cleveland market is active with the best volume of inquiry in some time, while here and elsewhere it is reported that the Pennsylvania Railroad has a list out for shop equipment comprising 900 items. Cincinnati reports a good volume of quiet buying which has been under way two or more months. Inquiry is better in Detroit, and some especially good business is being done in wood-working equipment. The closing of large railroad lists which were placed before the Chicago trade by the railroads will make the August total a large one in Chicago. In the Central South there is good business in prospect, although present conditions are quiet. The demand in Birmingham is steady and satisfactory and of a general character. In St. Louis cotton machinery has been a source of demand. Irrigation plants are contributing most to the Texas trade. There are prospects of good purchases on the Pacific coast in the fall, especially in view of the expected construction of industrial plants.

New York

NEW YORK, August 21, 1912.

Actual sales fell off somewhat since the last report, but despite this fact it is conceded generally that the machinery trade in New York and vicinity is satisfactory considering the season. The undertone is healthy; inquiries, though not unusual in size, are numerous and indicate that good buying is soon to materialize. Reports continue to reach New York representatives that export demands are exceedingly good and contributing heavily to the activity of several manufacturing plants. The Baldwin Locomotive Works was in the market recently for Gray planers, taking all that were obtainable on immediate delivery. This company had other needs as well, in consequence of the many locomotive orders it has booked in recent months. The West Philadelphia Trade School, which has purchased rather extensively of machine tools in the last few days, placed a few good orders in New York. The Baron de Hirsch Trade School, New York, whose list of requirements was published last week, will place orders this week or in the early part of next, and with other prospective business the coming week is expected to bring an improvement in the volume of local trade. The anticipated Baltimore & Ohio Railroad list is still hanging fire, though nearing the trade every day.

The American Stopper Company, Brooklyn, N. Y., has awarded a general contract to the Turner Construction Company, 11 Broadway, New York, for the construction of a factory building 80 x 140 ft., four stories, at Dwight and Verona streets. The building will be reinforced concrete throughout.

William Crabb & Co., Newark, N. J., manufacturers of mill supplies, are taking bids through Frank Wark, architect, Roseville avenue, for a one-story addition to their factory on Third avenue. The estimated cost is \$15,000.

The Fairbanks Company, Binghamton, N. Y., has taken out permits for the erection of three buildings on its property on Glenwood avenue and Main street. There will be an iron foundry, a brass foundry and a melting room. All of the buildings are to be of brick and practically fire proof, and are estimated to cost \$4,000. The machinery required, most of which has been purchased, covers all classes of foundry appliances.

The Board of Water Supply, 165 Broadway, New York, is receiving sealed bids until September 10 for construction of five superstructures for Foundry Brook and Indian Brook siphon chambers and Breakneck gauging chambers of the Catskill Aqueduct. There will be four siphon chamber buildings each 31 x 39 x 27 ft. and one gauge chamber building 19 x 32 x 20 ft.

The Adirondack Power Company is planning improvements to its plant at Saratoga, N. Y., which will require an expenditure of approximately \$500,000. The Stone & Webster Engineering Company, Boston, are managers for the power company.

The Hemsher Metal Company, Phoenixia, N. Y., has been incorporated and will engage in metal work-

ing and manufacturing. The company has a capital stock of \$20,000, and its directors are Ralph O. L. Fay, Kannek, Rockland County, N. Y.; Norman W. Cole, 16 Central Park West, New York City, and Evan L. Tamblin, Brooklyn.

Endicott Johnson & Co., Binghamton, N. Y., are having plans prepared for the rebuilding of their entire plant for the manufacture of shoes. The new and reconstructed buildings will be fire proof and will cost approximately \$300,000.

The Deep River Mills, manufacturer of textiles, Randleman, N. Y., has awarded contracts for an electrical power house and electrical equipment for 1000 hp. capacity, requisite for operating the three plants of the company, Mills Nos. 1 and 2 and the Marie Antoinette mill. The power plant will be located at Mill No. 1. When finished 100 additional looms will be installed. Contracts let amount to about \$60,000.

The Industrial Motor Car Company, Middletown, N. Y., has been incorporated with \$350,000 capital stock to manufacture motor vehicles. W. A. Courtland, C. W. Jewell and M. G. Crawford of New York City are the incorporators.

The Gloversville Silk Glove Factory will remove September 1 from Lyons, N. Y., to the factory building of Edward Sauter on Geneva street, Gloversville, N. Y., which is being equipped for the purpose. The owner of the property is having plans prepared for a new factory building adjoining which will enable the company to materially enlarge its output.

The America Glove Company, Dunkirk, N. Y., has completed arrangements for adding a third story to its factory building on Railroad avenue East, for which additional equipment will be required.

The Vacuum Oil Company has completed plans for additions to be made to its plant at Olean, N. Y., the estimated cost of which is \$250,000.

The extensive plant of the Cyphers Incubator Company, manufacturer of poultry supplies, at Court, Fourth and Georgia streets and the Erie Canal, Buffalo, was totally destroyed by fire August 16, with a loss of \$300,000 on buildings and machinery. It is the company's intention to rebuild the plant at once.

The Positive Clutch & Pulley Works, 28 to 36 Lansing street, Buffalo, N. Y., has recently been purchased by a company composed largely of Canadian capitalists and reorganized as the Positive Clutch & Pulley Company. The only American investor, Ulysses S. Candell, for many years vice-president of the Barcalo Mfg. Company, Buffalo, has been elected president. The other officers are, vice-president, Thomas A. Chisholm, a Toronto banker, and secretary-treasurer, Geoffrey T. Clarkson of the old established firm of E. R. C. Clarkson & Sons, Toronto. The product of the company will be the Positive line of power transmission appliances. The company will later enlarge its plant on Lansing street and install additional machinery equipment.

The Weaver-Naylor Company, manufacturer of patented roofing material, Buffalo, has purchased additional ground and will build an addition 60 x 140 ft. to its plant on Chandler street and the New York Central Railroad belt line.

New England

BOSTON, MASS., August 20, 1912.

Users of machine tools who have not been in the market of late and have not kept close watch of its rapidly changing conditions will probably meet with disappointment later in the matter of deliveries. The dealers' sheets show that many sizes or classes of tools are no longer available for immediate shipment, and the increasing demand, coupled with the fact that accumulated stocks are dwindling, will accentuate the difficulty of procuring machinery as the months pass by. The general opinion is that the increase in productive capacity of the builders in the last five years has not kept pace with the normal demand under conditions of really good business. The situation in the new tool market is reflected in second hand machinery.

The dealers are watching for the big list of the Boston & Maine Railroad for its Billerica shops. Tentative inquiries have been sent out by the engineers in charge of the equipment, and the indications are that the list itself will be forthcoming in the near future. The crane requirements have already been published in this column. The machinery list will be one of the largest ever figured in New England. The Vermont Central Railroad, of the Grand Trunk system, will doubtless require cranes and other equipment for the new shops at St. Albans, Vt., in addition to the list of machine tools published in *The Iron Age* of August 1.

A new corporation has been organized with a Massachusetts charter to take over the business of the Morgan Motor Truck Company, Worcester, Mass. The company will bear the same name as the old and has an authorized capital stock of \$300,000. The chief purpose of the reorganization is to wipe out the \$500,000 of common stock and to reduce book values to actualities. Charles B. Foster, Westboro, Mass., formerly of Foster Bros., Utica, N. Y., enters the corporation as its president. Evan F. Jones, general manager of the Morgan Spring Company, Worcester, remains as treasurer, and Charles H. Derby as clerk. The directorate consists of Mr. Foster, Mr. Jones, Jerome R. George of the Morgan Construction Company, John E. Bradley of the Bradley Car Company, all of Worcester, and Lancaster P. Clark, head of the machinery division of the Blake & Johnson Company, Waterbury, Conn.

Manning, Bowman & Co., Meriden, Conn., manufacturers of hardware specialties, are planning the erection of a new building 40 x 120 ft., five stories, of brick with reinforced concrete floors.

The Hoggson & Pettis Company, New Haven, Conn., manufacturer of chucks, will erect a new building at Wallace and Wooster streets, 50 x 145 ft., of heavy mill construction. The structure is designed to take two additional stories later.

The contract just made by the Blakeslee Drop Forging Company, Plantsville, Conn., calls for a machine shop 30 x 160 ft., three stories; an annealing shop 32 x 72 ft., one story, and a forge shop 50 x 220 ft., one story. The construction will be of brick and steel.

The American Buckle Company will erect a new factory building 25 x 42 ft. at West Haven, Conn.

The factory occupied by the C. F. Church Mfg. Company and the Wagner Spring Bed Company, Holyoke, Mass., was damaged by fire last week with a loss of some \$15,000.

The Quigley Furnace & Foundry Company has awarded the contract for its new plant to be erected at Chicopee, Mass., consisting of buildings respectively 100 x 200 ft. and 50 x 100 ft., one story, of brick and steel construction.

The United States Mill Supply Company, 7 Pine street, Providence, R. I., has acquired the building at South Water and James street, and will occupy the premises as storage and salesroom for its oil department.

The Domestic Vacuum Cleaner Company, Worcester, Mass., has absorbed the Domestic Vacuum Sweeper Company, Peoria, Ill., and the Domestic Sales Company, and has increased its authorized capital stock to \$250,000. The business is comparatively new, having been established but two years, in which time the working force has increased to 300 hands, producing about 500 vacuum sweepers daily.

Stone, Timlow & Co., Inc., 237 Congress street, Boston, leather manufacturers, will erect a factory building at Medford, Mass., four stories, of brick and concrete, to cost with its equipment \$100,000. The United Lace & Braid Mfg. Company is erecting a two-story brick mill at Auburn, R. I.

The Haydenville Company, Haydenville, Mass., man-

ufacturer of brass and iron goods for water, steam and gas, has purchased the plant of the Bay State Brass Company of the same town. The company states that it has not yet decided how it will conduct the new business.

Philadelphia

PHILADELPHIA, PA., August 20, 1912.

Irregularity is still noted in the demand for machinery and tools. Some merchants report an even volume of business as compared with the last few weeks, while others note somewhat lighter sales. The market has apparently developed one of the not unusual lulls in buying which are frequently noted at this season, in which the vacation period plays an important part. Probably the most important transaction this week was the closing by the local locomotive builder for a group of tools, which has been under negotiation for some time. Inquiries from buyers in this district have been lighter, although manufacturers report a fair demand from consumers in other districts. Railroad inquiry is still extremely light, the bulk of the sales being confined to single or small groups of tools. In the aggregate, however, tool builders, both in standard and special types, are receiving a very fair volume of business and plant activities are gradually improving. While there is some fair business under negotiation in power equipment, the general demand for engines and boilers has been only moderate. Boilers have been a shade more active than engines. A fair business in second-hand equipment of this character is noted. The demand for second-hand machinery and tools is irregular, in some classes of equipment good business is noted, others are quiet. Makers of both steel and gray iron castings note an increased demand and in instances better prices are being obtained, particularly for steel castings. Makers of steel castings are busier than they have been for many months. There is, however, still room for considerable improvement in the demand for gray iron castings.

The Vermont Marble Company, 201 South Thirty-eighth street, will erect a manufacturing plant for the working of marble, consisting of a 60 x 166-ft. and a 65 x 150-ft. two and three-story building. Power equipment will be required for installation in the new plant, but it has not been finally decided as yet what form of power will be adopted.

Announcement is made of the consolidation of the George V. Cresson Company and the Morris Engineering Company, both of this city. The Cresson Company has been in the hands of receivers, but we are advised that the receivers have now been discharged and the work is being carried on by the officers of the Morris Engineering Company. All business of the two companies will be continued as heretofore, and all the Cresson lines and in addition the sugar machinery equipment manufactured by the Morris Engineering Company will be built in the Cresson Company's plant at Eighteenth street and Allegheny avenue.

Joseph S. Neff, Director of the Department of Public Health and Charities, City of Philadelphia, will take proposals until August 27 for the construction of a water tower at the Philadelphia General Hospital, Thirty-fourth and Pine streets, also for the construction and erection of a sewage disposal plant at the Tuberculosis Sanatorium at Byberry.

Announcement is made in the public prints, under date of August 15, that the plant and storage warehouse of the Crisfield Ice & Electric Company, Crisfield, Md., had been destroyed by fire, estimated loss being \$100,000.

Announcement is made of the incorporation of the Safety Mfg. Company, Elizabethtown, Pa., with a capital stock of \$100,000, to manufacture safety appliances, castings, etc. The incorporators are Edward H. Gish, Elizabethtown, Pa.; John J. Kauffman, Millersville, Pa.; Harvey E. Sherts, Lancaster, Pa., and A. B. Magee, Dover, Pa.

The Voltax Paint Company of Pennsylvania, 4243 North Sydenham street, will, it is stated, erect a one-story brick factory building, 45 x 90 ft., and a boiler house, 22 x 15 ft., at Hillcrest, Pa. Details as to the company's requirements in the way of equipment are not available.

Petry-Cassidy, Inc., of this city, announce that after September 1 they will occupy new quarters on the first floor of Nos. 1427-29-31-33 Vine street. Besides manufacturing malleable iron wing nuts and thumb screws, Petry-Cassidy, Inc., are the exclusive sales agents for a number of automobile specialties in this and other territories.

The Merchant & Evans Company is preparing to move its tin plate dipping plant, which has been located in this city, to the new plant, which was acquired some months ago at Glenova, W. Va. On the removal of this plant to the new site a portion of the space occupied will be used for an extension to its machinery department for which some additional equipment has already been purchased.

George D. Porter, Director of Public Safety, City of Philadelphia, will receive bids until Aug. 26 for a large variety of electrical supplies, fire alarm and telephone cable, repairs to pumps, engines, etc., scales for boiler rooms and electrical apparatus. Specifications may be obtained at the office of the Electrical Bureau, Room 618, City Hall.

Proposals will be received by the Lighthouse Inspector, Philadelphia, Pa., for furnishing and delivering metal work and rebuilding the Brandywine Shoal Lighthouse, in the Delaware bay. Plans and specifications may be obtained from the office of the Lighthouse Inspector, this city.

Chicago

CHICAGO, ILL., August 20, 1912.

General machinery business has increased in volume in the past week, and the closing of the two or three large railroad lists within the next few days will add materially to a large total for August. The Chicago, Milwaukee & St. Paul Railroad, for which a number of purchases were made in the past week, is expected to be in the market again shortly and the Michigan Central Railroad is buying new tools for a round house at Kalamazoo, Mich., which will aggregate in value nearly \$8,000. It will also require new machinery for its shops at Bay City, construction of which is just now starting. The United States Ball Bearing Company has placed orders for machines aggregating close to \$20,000 in value for its Oak Park, Ill., plant. In some lines machine tool manufacturers are beginning to have difficulty in making the deliveries asked of them.

The General Chemical Company, 112 Adams street, Chicago, has taken out a permit for a one-story brick machine shop to cost \$2,500.

The Otis Elevator Company is planning an addition to its Quincy, Ill., plant, for which an estimated expenditure of \$30,000 is contemplated.

The Illinois Pipe & Mfg. Company, Chicago, has been incorporated with a capital stock of \$2,500, to deal in iron and steel, by Samuel Lanski, Israel Lanski and Abe Lanski.

The Baker Mfg. Company, formerly of Plano, Ill., has moved its plant to Springfield where it will be in operation in the near future.

Howe & Peterson, 867 Larrabee street, Chicago, have taken out a permit providing for the erection of a two-story brick machine shop.

W. F. & John Barnes Company, Rockford, Ill., has plans under way for the enlargement of its foundry.

The Cotta Gear Company, Rockford, Ill., has let the contract for an addition to its plant.

The Springfield Light, Heat & Power Company, Springfield, Ill., has begun work in the erection of a new heating plant to cost \$40,000.

The American Channel Motor Company, Joliet, Ill., has secured property in that city upon which a two-story factory building will be erected.

The town of Anna, Ill., will receive bids until August 26 for the construction of a cement reservoir, filter plant, etc. Dabney & Maury, Chicago, are the engineers.

The Moline Scale Company, East Moline, Ill., has awarded the contract for an addition to its plant 72 x 176 ft., of brick construction and to cost \$50,000.

The Independent Electric Mfg. Company, Milwaukee, Wis., is taking bids for the erection of a one-story manufacturing building 65 x 125 ft.

The Packard Motor Car Company, Detroit, Mich., is contemplating the erection of a branch factory at Milwaukee, Wis.

The Twin City Transit Company, St. Paul, Minn., is having plans prepared for the erection of shops to cost \$22,000.

The Davenport Foundry & Machine Company, Davenport, Iowa, is building an addition to its foundry 100 ft. square, two stories, at a cost of \$15,000. No equipment will be installed.

The Waterloo Malleable Iron Works, Waterloo, Iowa, is contemplating improvements and extension of its foundry which will involve expenditure of about \$35,000.

The W. C. Hall Milling Company, Brazil, Ind., is

engaged in enlarging its milling plant and installing new machinery which will double its capacity.

The Hoosier Mfg. Company, New Castle, Ind., has taken out a building permit providing for the erection of a brick manufacturing building to cost \$20,000.

Pittsburgh

PITTSBURGH, PA., August 20, 1912.

American manufacturers are now shipping large quantities of iron and steel products, machinery and other goods into Canada. One of the largest inquiries sent out from that country in a long time is that of the National Car Company, Ltd., Hamilton, Ontario, which has just reached the principal American makers, and is as follows:

Steel Preparation Department

One 120-in. plate shear, capacity $\frac{3}{4}$ -in. plate, throat 18-in., air counter balance, arranged for motor drive.
One 60-in. plate shear, capacity 1 in. plate, throat 12-in., air arranged for motor drive.
One angle shear, size B, capacity 6x6x1-in., turntable operated by rack arranged for motor drive.
Two multiple punches, capacity $4\frac{3}{4}$ -in. holes through $\frac{3}{4}$ -in. plate, maximum distance between outside holes 24 in., arranged for motor drive.
Four No. 2 quick action punches, 18-in. throat, 3 gags, National C. standard block and strippers, arranged for motor drive.
One No. 1 quick action punch, 12-in. throat, 3 gags, National C. standard block and strippers, arranged for motor drive.
One coping machine, size D, arranged for motor drive.
One Higley cold saw, 18-in. blade, arranged for motor drive.
Four plate punches, $\frac{3}{4}$ x $\frac{3}{4}$ x36-in. throat, $\frac{3}{4}$ -in. hole, $\frac{3}{4}$ -in. plate, arranged for motor drive.
One flange punch No. 2, with base, 15-in. throat, architectural jaw, 3 gags, National C. standard block and strippers, arranged for motor drive.
One No. 5 punch, 18-in. throat, $2\frac{1}{4}$ in. through $1\frac{1}{4}$ -in. plate and extra price for shear blades, arranged for motor drive.
One set piping valves and attachments for presses, arranged for motor drive.
One 500-ton hydraulic press approximate size 3x6 ft. inside of bolts.
One 1,000-ton hydraulic press, approximate size 3x6 ft. inside of bolts.
One 1500-ton hydraulic accumulator and pumps, arranged for motor drive.
Two hydraulic 8-in. gap riveters.
Two hydraulic 8-in. punch riveters.
Two portable bull riveters 1-in. compression lever.
One hydraulic tail strap riveting machine.
24 No. 80 Boyer hammers, $2\frac{1}{2}$ -in. taper pistons.
20 No. 2 Little Giant improved car drills.
One No. 2 Boyer chipping hammers.
Two class D Little Giant reamers.
One Cleveland wall radial drill, 8-ft. arm, fixed arm type motor drive.
One 6x10-ft. double end-furnace.
18 rivet heating furnaces.

Truck Shop

One wheel press steel frame, 200 tons capacity, for 33-in. wheels, motor drive.
Five axle lathes.
Two wheel boring mills, heavy type, complete with cranes, motor drive.
One tool grinder.

Forge Department

One No. 8 bulldozer, motor drive.
One No. 6 bulldozer, motor drive.
One Bradley hammer, wooden arm, 150 lbs., motor drive.
One pneumatic forging hammer, 1500-lb. head, double frame, motor drive.
One No. 2 eye bender, motor drive.
One Acme upsetter, 2-in. capacity, motor drive.
Two Acme upsetters, $1\frac{1}{2}$ -in. capacity, motor drive.
Two continuous rivet machines for $\frac{3}{4}$ -in. rivets, motor drive.
Three double head bolt cutters, 2 in., motor drive.
One triple head rod threading machine, 1 in., arranged for motor drive.
One nut tapping machine, 8 spindle, 1 in., arranged for motor drive.
One nut tapping machine, 4 spindle, 2 in., arranged for motor drive.
One 6-spindle drill, 8-ft. 6-in. table arch bars, arranged for motor drive.
One 6-spindle drill, 8-ft. table, 4 levers, etc., maximum capacity 1 in. hole in steel, arranged for motor drive.
One No. 2 quick action punch, 3 gags, arranged for motor drive.
One round iron shear, 1-in. round, arranged for motor drive.
Two heating furnaces, 4x8 ft.
Six forging furnaces.
Six rod and rivet heating furnaces.
One drop hammer, 1000 lbs., arranged for motor drive.

Machine Shop

Two tool lathes, 14 in. x 8 ft., belt driven.
One bed planer cross and side head, 36 in. x 8 ft. 0 in., arranged for motor drive.
One shaper, 16 in., belt driven, arranged for motor drive.
One automatic turret lathe, 2x24 in., belt driven.
One engine lathe, 30 in. x 12 ft., arranged for motor drive.
One radial drill, 6-ft. swing, speed box type, arranged for motor drive.
Two single spindle H. S. 24-in. drills, belt driven.
One pipe threading and cutting machine, 8 in., belt driven.
Two pipe threading and cutting machines, 2 in., belt driven.
One double emery wheel stand, belt driven.
One drill grinder, belt driven.

Wood Machine Shop

One 4-side planer, 10x12 in., arranged for motor drive.
Three matching planers, $1\frac{1}{2}$ x12 in., arranged for motor drive.
One flooring planer, 3x20 in., arranged for motor drive.
Four swing cut-off saws, 24 in., with tables, arranged for motor drive.
One railroad cut-off saw, 42 in., arranged for motor drive.
One heavy band saw, 36 in., arranged for motor drive.
One self-feed rip saw, arranged for motor drive.

One hollow chisel mortiser, arranged for motor drive.
 One mortiser, arranged for motor drive.
 One gainer, arranged for motor drive.
 One horizontal double end tenoner, arranged for motor drive.
 Three 4-spindle wood boring machines with tables, the end spindle to operate radially, arranged for motor drive.
 Three 4-spindle wood boring machines, without tables, the end spindle to operate radially, arranged for motor drive.

Cleveland

CLEVELAND, OHIO, August 20, 1912.

The local machine tool market is quite active and there is a better volume of scattered inquiry pending than for some time. Sales in the week were mostly single tools and small lots, but the aggregate business was very satisfactory. The demand for milling machines is particularly good. Lathes are also moving quite freely. In the opinion of one of the local dealers business is better in this territory than it has been for five years. Business with machine tool builders is coming out in good volume. The railroad demand has improved materially. Some of the local builders are preparing bids on the machine tool requirements contained in the list recently issued by the Pennsylvania Railroad for its northwest system. This list is for equipment at various shops of Ohio, western Pennsylvania, Indiana and Illinois, and includes 900 items. A large assortment of machinery is contained in the list, which includes cranes, standard machine tools, large railroad tools, steam hammers, woodworking tools, generators, air compressors, air drills, etc. Bids on this list will be received August 23. The demand for rolling mill equipment is quite active.

The Walker Tire Chain Company, Toledo, Ohio, recently incorporated with a capital stock of \$150,000, will establish a plant in that city for the manufacture of a patented anti-skid automobile and truck chain. It is stated that eventually a complete manufacturing plant, including a foundry, will be erected. The officers of the company are now at 645 Ohio Building. The officers are: H. F. Rohrman, president; Hugh Williams, vice-president; Maurice A. Carter, treasurer, and Charles E. Newman, secretary.

The Browning Foundry Company, Ravenna, Ohio, has enlarged its plant by the erection of a fireproof pattern house 60 x 100 ft. and has plans completed for a power house. Other improvements are being considered.

George F. Mittinger of Cleveland and officials of the Petroleum Iron Works Company, Petroleum, Pa., are interested in a new company to be known as the Pressed Steel Products Company, which will establish a plant at Sharon, Pa., for the manufacture of various articles from the lighter gauges of sheet steel. Two buildings will be erected at the start, a main building 50 x 400 ft., and a pickling and galvanizing department, 50 x 150 ft. It is stated that the erection of a plant will be started at once and that it will be in operation within five months. Mr. Mittinger will be the manager.

The Forberth Carbureter Company, Youngstown, Ohio, has been incorporated with a capital stock of \$70,000 to manufacture a new carbureter invented by D. E. Forberth, Cleveland, Ohio. A manufacturing plant will be established. The incorporators are E. A. Hegg, J. F. Williams, Thomas L. Morgan and others.

The Geneva Metal Wheel Company, Geneva, Ohio, has let a contract for the erection of an addition to its plant 102 x 192 ft. which will be used as a foundry and erecting room.

A large addition will be built to the plant of the Russell Engine Company, Massillon, Ohio, as a result of the consolidation of that company with the Griscom-Spencer Company, Jersey City, N. J., under the name of the Griscom-Russell Company.

The Ashtabula Hide & Leather Company, Ashtabula, Ohio is erecting a new storage building 30 x 100 ft. The present building will be converted into a laboratory and machine shop. A gas engine will be installed.

It is reported that the Henry L. Dougherty Company, New York City, which recently purchased a chain of power plant in northern Ohio, is planning the erection of a large plant to supply power for a number of cities. The location has not yet been decided upon.

The C. O. R. Cutter Company, Cleveland, Ohio, which was recently incorporated with a capital stock of \$30,000, will manufacture reamers in a plant at 1181 East Eighty-fourth street. The new company, it is stated, is practically a combination of the former Corux Company and the Nonpareil Reamer Company, Cleveland.

The Timken Roller Bearing Company, Canton, Ohio, will shortly begin the erection of an addition to its plant 64 x 260 ft. It will be of steel construction.

The East Palestine Rubber Company, East Palestine, Ohio, has been incorporated with a capital stock of \$50,000 to manufacture automobile tires and other rubber products. The company expects shortly to begin the erection of a plant. Wilmer Dunbar is president and Abram Hartley is secretary and treasurer.

The Tri-State Railway & Electric Company, which is controlled by J. G. White & Co., 43 Exchange Place, New York, has under consideration extensive improvements including a \$1,500,000 power house to be built at East Liverpool, Ohio.

The Mechanical Process Mfg. Company, Toledo, Ohio, has been incorporated with a capital stock of \$10,000 to manufacture machinery and tools. Walter Stewart, Isaac Kinsley and others are the incorporators.

The Liquid Forged Steel Company, Cleveland, has been incorporated with a capital stock of \$10,000 by A. F. Kwis, E. B. Gilchrist, E. L. Furston and others.

The Glacier Mfg. Company has acquired the Forsythe Pattern Works property in Youngstown, Ohio, and will move to that city from Pittsburgh. Contracts have been placed for the installation of plant equipment. The company manufactures refrigeration equipment. J. D. McTigue is president.

The West Steel Casting Company has increased its capital stock from \$60,000 to \$80,000.

Planning the manufacture of valves the Automatic Retaining Valve Company, Cleveland, has been incorporated with a capital stock of \$20,000 by A. J. Pierson, L. R. Canfield, J. L. Bradley and others.

The Cleveland Folding Wire Basket Company, Cleveland, has been incorporated with a capital stock of \$10,000 to manufacture folding crates and baskets. Frank W. Smith, Edgar C. Jeffries, S. L. Owens and others are the incorporators.

The Big Four Railroad has placed contracts for the erection of a new machine shop and power plant at Springfield, Ohio.

The Standard Stamping Company, Marysville, Ohio, will enlarge its plant by the erection of a two-story brick building 30 x 50 ft. to be used for office purposes. The space now occupied by offices in the main building will be used for manufacturing. Some new machinery will be installed.

The village of Baltic, Ohio, will sell \$11,000 worth of bonds to secure funds to build a waterworks plant.

The Perfection Metal Bar Company, 3321 Lorain avenue, Cleveland, will enlarge its plant by the erection of a two-story addition 50 x 125 ft. Some new machinery will be required. The company makes brass, copper and bronze construction for store fronts. It has increased its capital stock from \$10,000 to \$30,000.

The Ohio Steel Foundry Company, Lima, Ohio, is having plans prepared for additions which it is stated will double the capacity of its plant.

Cincinnati

CINCINNATI, OHIO, August 20, 1912.

It would be wise for anyone interested in machinery sales to watch the railroads carefully. It is generally admitted that a great deal more railroad buying is being done than appears on the surface, and it is safe to assume that the volume of purchases from this source has been larger during the last two months than it has been at any time in the past two years. For some reason the railroads are moving very cautiously in this respect, and the present practice is to send out small lists to various manufacturers and dealers asking for quotations only on the tools that they make or handle. Whether this indicates a desire on the part of the railroads to keep their buying affairs quiet, or is simply a change in policy affecting their office systems, it is hard to say.

It is reported that a large dealer in machine tools purchased in the Chicago market last week a batch of tools running over \$100,000 in value and that some of this business was divided up between Cincinnati manufacturers.

Second-hand machinery continues quiet. Boiler makers report a little better activity, especially in the tank line. The foundries are nearly all gradually increasing their melt.

The Pratt & Whitney Company, Hartford, Conn., has leased a salesroom at 336 West Fourth avenue, Cincinnati, and will soon open a branch office there for handling its Central Western business. A sample line

of tools will be carried in stock. C. M. Pond, manager of the Cleveland branch, will have supervision over the new Cincinnati office.

Local machine tool builders are figuring on a fair-sized list of machine tools issued by the Pennsylvania lines. West, and purchases on this list are expected to be made within the next 30 days.

W. A. Clark, secretary Board of Trustees of the village of Wyoming, Ohio, will open bids August 31 for one 1,500,000 gal. pumping engine; two 150 h.p. boilers; air lift equipment for a 10 or 12-in. well and valves, gauges and other fittings.

As previously mentioned, the Cincinnati Ball Crank Company intends moving its plant from the present location on Plum street, Cincinnati, to Oakley, and has recently let contract through B. L. Baldwin & Co. for a one-story brick building 60 x 120 ft. Work on the foundations is already under way and the firm expects to be in its new quarters before the commencement of the winter season.

The Charles Boldt Glass Company, Cincinnati, has had plans prepared for an addition to its plant 84 x 170 ft., one story and of brick and steel construction, for which some special equipment will be required.

The F. H. Lawson Company, Cincinnati, has awarded contract to the John Griffiths Sons Company for a four-story warehouse addition to its plant on Whately street, that will be 52 x 86 ft. and of brick construction.

The Foos Gas Engine Company, Springfield, Ohio, has increased its capital stock from \$260,000 to \$310,000, and contemplates adding to its manufacturing facilities at an early date.

The Ashland Foundry Company, Ashland, Ohio, recently mentioned as being incorporated with \$15,000 capital stock, advises that it is erecting a one-story brick building 50 x 135 ft., with engine room and pattern vault. The new company will handle general jobbing foundry work as well as operate a pattern shop.

Fire recently partially destroyed the plant of the Ohio State Stove Company, Columbus, Ohio. Temporary operating quarters were secured and it is stated the damaged foundry will be rebuilt at once.

The Stacey Mfg. Company, Cincinnati, manufacturer of gas retainers and railroad specialties, has increased its capital stock from \$150,000 to \$750,000, and it is reported that some extensive additions are to be made to its plant at Elmwood place.

The Columbus Machine & Tool Company, Columbus, Ohio, whose reorganization plans were recently mentioned, has awarded contract for a large factory and office building to be erected on Marion road.

F. E. Myers & Brother, Ashland, Ohio, manufacturers of pumps and hay tools, plan shortly to enlarge their plant by the erection of a building, 50 x 160 ft., four stories and basement. The basement will be used for storing castings, the first and second floors for manufacturing, the third floor for storage and the fourth floor for a paint shop.

Hamilton

HAMILTON, OHIO, August 20, 1912.

The machine tool business in Hamilton continues to maintain the improvement experienced during the present year. While the situation cannot yet be described as normal, local plants are operating about 50 per cent. in excess of one year ago, and look forward confidently to a further expansion of business in the fall and winter.

The Hamilton Chamber of Commerce today announced through its Industrial Committee the closing of a deal for the location of the National Pretzel Company of Cincinnati in this city. The company acquires the extensive plant formerly occupied by the Victor Foundry Company and will take immediate possession. The building will be converted into a plant for the manufacture of pretzels and pretzel meal and will have a capacity sufficient to handle 25,000 lb. of flour per day. It is expected that the improvements will be completed and the plant operated by early fall.

Clifford Kern has resigned the presidency of the Kern Machine Tool Company, of this city, and has sold his stock in the company to strong local financial interests. A. T. Letherby will continue his connection with the company. A reorganization will be effected by the directors in the near future and the company will considerably increase its scope of activities.

The Miles Tool Works Company reports a good volume of foreign business steadily maintained. Domestic orders are comparatively light, but the railroad inquiry is active and there are indications of heavy future buying from this source. It seems certain that

a considerable proportion of the largest orders about to be placed in Ohio will come to this city.

The Hoooven-Owens-Rentschler Company is operating well toward its capacity and reports a satisfactory situation. Some difficulty is being experienced in securing an adequate supply of skilled machinists for immediate purposes.

The Beckett Paper Company has let contracts for the addition of another floor to its offices and warehouses. These extensions are made necessary by the continued growth of the company's business.

Building operations in Hamilton will be very extensive next year. On August 31 bids will be received for a new Y. M. C. A. building to cost approximately \$175,000; on August 19 bids will be received for a \$75,000 improvement on the Butler County courthouse; within the next 60 days the Hamilton Board of Education will receive proposals for a \$250,000 high school building. The board has just retained F. G. Mueller of Hamilton and Frank L. Packard of Columbus as architects for this building. Geo. Barkman of Hamilton has been retained as the architect for a new \$40,000 school building in the Fifth Ward, contracts for which will shortly be let. The Lowenstein-Loeb Furniture Company has prepared plans for a six-story ferroconcrete business block and will shortly receive proposals.

The Cullen & Vaughn Company, recently incorporated, has acquired the property of the Semler Milling Company, which will be reconstructed for a planing mill and general mill work purposes.

Detroit

DETROIT, MICH., August 20, 1912.

The past week has shown a fairly good volume of business in machine tool circles. Inquiry is better and business seems to close easily, which is a source of great satisfaction to dealers. Extensions and improvements to plants are not numerous in Detroit at present and consequently this has affected the market considerably, but there is considerable activity in different parts of the state. Some good business in woodworking equipment from Grand Rapids is reported. Second-hand machinery continues to drag and dealers' stocks are increasing. New business in boilers and engines is light and almost entirely in medium or small capacity installations. Building conditions are reported more active, but new contracts awarded are mostly additional ones on buildings already under construction.

The Cadillac Motor Car Company, Detroit, has taken out a building permit covering the erection of a four-story brick factory 128 x 240 ft., to cost \$65,000, at Fort and Twenty-first streets.

Young Bros., 313 Franklin street, Detroit, makers of copper and iron specialties, have begun the construction of a considerable addition to their plant.

The Central Heating Company, Detroit, will erect a new heating plant, 100 x 119 ft., four stories and of steel construction, to cost \$100,000. Some miscellaneous equipment will probably be required.

The Marshall Butters Lumber Company, L'Anse, Mich., has been incorporated with \$1,500,000 capital stock for the purpose of developing an extensive timber tract in northern Michigan. The company will build a sawmill having a capacity of 30,000,000 ft. annually and is also considering the erection of a blast furnace and chemical works. The officers include Marshall F. Butters, Ludington, president, and Robert H. Butters, L'Anse, secretary and treasurer.

The Owosso Creamery Company, Owosso, Mich., has been incorporated with \$100,000 capital stock to operate a plant for the manufacture of mills products. The stockholders are W. L. Moore, Glen L. Brown and Arthur R. Heinze, Chicago.

Grand Rapids advises state that the Indiana Indestructible Paint Company, Chicago, will remove its plant to that city. The company has a capital stock of \$100,000. The Grand Rapids Board of Commerce has the matter in hand.

The Watervliet Paper Company, Watervliet, Mich., has filed notice of an increase of capital stock from \$250,000 to \$400,000 and will also issue \$150,000 of bonds for the purpose of doubling the capacity of its plant. The first of the new buildings will be a coating mill to cost \$100,000.

The Zinc Collar Pad Company, Buchanan, Mich., has acquired a new factory building, 66 x 166 ft., two stories, and will materially increase its operations. The company manufactures zinc and leather collar pads and other leather specialties.

The Chevrolet Motor Company has acquired the factory of the Imperial Wheel Company and adjoin-

ing land at Flint, Mich., and will shortly begin the manufacture of automobiles. The company will operate as a subsidiary of the new \$65,000,000 corporation of which W. C. Durant is the head.

The Champion Ignition Company, Flint, Mich., manufacturer of ignition devices, has begun the construction of an addition to its plant to be used mainly as an extension of its porcelain department. Not much new equipment will be required.

The Board of Commerce of Flint, Mich., has concluded negotiations with the Marvel Carburetor Company, Indianapolis, Ind., whereby the company will remove to Flint. A factory has been arranged for and the company will at once begin the dismantling of its present plant.

The Henry School Furniture Company, Grand Rapids, Mich., has taken out a building permit covering the erection of a two-story factory of cement construction to cost \$5,000.

The City Council of Coldwater, Mich., will erect a coal house at the waterworks plant and will install modern conveying machinery therein.

The city of Dowagiac, Mich., is inquiring for prices on both a direct current electric generator and an alternating current machine. Address the City Council.

The taxpayers of Newaygo, Mich., have voted to bond for \$17,000 to rebuild the municipal waterworks.

The D. A. Stratton Company, Atlantic, Mich., has been incorporated with \$100,000 capital stock to operate a woodworking plant and sawmill. The incorporators are D. A. Stratton, Grand Rapids, and F. W. Nichols and F. R. Bolles, Houghton.

The Mason Motor Company, Flint, Mich., maker of gasoline motors, is planning the erection of an addition to its plant of about 15,000 sq. ft.

The Lyons Machine & Mfg. Company, Lyons, Mich., has increased its capital stock from \$10,000 to \$100,000 to provide for its rapidly growing business.

Thomas Foster, Sault Ste. Marie, Mich., is planning to develop his extensive timber holdings and will erect a sawmill.

The Hawthorne Paper Company, Kalamazoo, Mich., has increased its capital stock from \$250,000 to \$400,000.

The National Lock & Stamping Company, Grand Rapids, Mich., has been incorporated with \$10,000 capital stock to do a general metal specialty manufacturing business.

The Sanitary Utilities, Inc., Detroit, Mich., has been incorporated with \$10,000 capital stock to manufacture toilet articles. The incorporators are Robert Mowat, L. R. Acton and J. E. Spencer.

The Holland St. Louis Sugar Company, Holland, Mich., is about to erect an addition to its beet sugar factory.

The Industrial Works, Bay City, Mich., plans to begin at once the erection of new shops near its present plant. The new building will be approximately 140 x 500 ft.

The Michigan Central Railroad is about to begin construction work on car shops at Bay City, Mich., involving a construction expense of \$200,000 and \$300,000 additional for equipment.

St. Louis

St. Louis, Mo., August 19, 1912.

Business in the machine tool market the past week has kept up very well for the season. While no large lists have been put out and no large contracts made, the aggregate has been satisfactory to the dealers. There has been some activity in lines affected by agricultural requirements and the approach of the cotton picking season has brought gin and compress demands into the market. Collections are regarded as reasonably satisfactory.

As a result of inability to get lower rates on electric current after repeated efforts, an organization of business men has been formed at Hannibal, Mo., and is proceeding to get franchises and to raise capital for a new electric light plant.

The town of Hollister in Taney County, Mo., has completed arrangements for the construction of a power dam for an electric plant and has asked Government permission to proceed with the work.

The Continental Radiator & Foundry Company, L. F. Ostrander, president, of St. Louis, has increased its capital from \$150,000 to \$300,000, and will increase the mechanical capacity of its plants at St. Louis, Mo., and Belleville, Ill. It has also acquired a plant at Ft. Madison, Iowa, which it will remodel to some extent.

The Moloney Electric Company, St. Louis, with a branch in Windsor, Canada, has reorganized with \$700,000 capital stock and will increase its capacity for the manufacture of high-efficiency transformers.

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The City Council of Springfield, Mo., has decided to reject offers for the sale to the city of existing lighting plants and will enter the market for the construction of a new municipal plant.

The Roberts, Johnson & Rand branch of the International Shoe Company, St. Louis, will build at once a five-story factory and equip it with machinery for the exclusive manufacture of heels for its other factories.

The Banner Buggy Company, St. Louis, has bought the large plant of the Cooper Carriage Wood Work Company, and will remodel and re-equip it with machinery at a total investment of \$200,000.

The Camillio Mining Company, Sedalia, Mo., has been organized with \$120,000 capital by Charles F. and Charles H. Walch and Louis Monsees, and will equip and develop mining property owned by them.

The Fischer Fuel Company, Millstadt, Ill., recently noted as incorporated with \$50,000 capital stock, is in the market for a line of machinery to be used in stripping coal land instead of the usual shaft mining. The coal beds are close to the surface and are to be uncovered.

The Columbia Quarry Company, Columbia, Ill., suffered a loss of \$50,000 by fire the past week, much of its mechanical equipment being destroyed. It will all be replaced at once.

George L. Green, Newark, Ark., has purchased 2300 acres of timberland and will install sawmills to work up the lumber, chiefly hardwood.

The Ozark Diamond Mines Corporation, Murfreesboro, Ark., has been organized with \$100,000 capital stock by Horace E. Bemis of Prescott, Ark., and will install equipment for diamond washing.

The Horseshoe Mining & Milling Company, Carthage, Mo., has been incorporated with \$25,000 capital stock by Harry Marks to equip and operate a tailing mill at Alba, Mo.

The Scott County Land & Lumber Company, Waldron, Ark., has been organized with \$20,000 capital stock to equip sawmills and develop timberland owned by W. F. Ingham, J. S. Hill, Roscoe McKnight and C. E. Forrester.

The Petrous Mfg. Company, Biloxi, Miss., is being organized by L. D. Byrd to equip a plant for the manufacture of turpentine cups and posts under new patents.

The Tecumseh Broom Company, Tecumseh, Okla., has been incorporated with \$25,000 capital stock to establish a broom manufacturing plant. The incorporators are J. B. Smith, J. F. Legg and C. L. Greene.

The Swap-Benyon Automobile Repair Company, St. Louis, with \$21,000 capital stock, has been incorporated by T. W. Swap, Charles A. Madill and Albert Benyon to establish a large automobile repair shop with extensive mechanical equipment.

The Panola Cordage Company, Batesville, Miss., will add to its present mechanical capacity sufficient equipment to double its output.

The city of Dexter, Mo., has voted a bond issue of \$25,000 to be used in constructing municipal waterworks.

The Prichard Gin & Mercantile Company, Prichard, Miss., with \$10,000 capital stock, has been incorporated by Manley Fox, F. J. Henning and W. C. Evans. Construction begins at once.

The Industrial Iron Works, Clinton, Mo., has completed plans to establish a plant at Joplin, Mo., involving an expenditure of about \$25,000 for mechanical and power equipment. William F. Hall of Clinton is in charge of the work.

The Planters' Gin Company, with \$10,000 capital stock, will equip a cotton gin at Merigold, Miss., at once. The stockholders are W. H. Sherman, J. B. Lee, J. A. Sample and others.

The Cushing Compress Company, Cushing, Okla., with \$20,000 capital stock, has been organized by Williams Hill of Alexandria, La.; John Foster of Cushing and A. E. Senter of Duston, Okla., and will equip a compress at once.

The Planters' Gin Company, Swink, Okla., with \$5,000 capital stock, has been organized by J. M. Herd, D. R. Swink, J. H. Hawkins and others and a plant will be equipped at once.

An issue of \$53,000 of waterworks bonds has been voted by the city of Dexter, Mo., and the work of construction will be entered upon as soon as plans can be completed.

The William McDonough Stave Company, Leola, Ark., has been incorporated with \$10,000 capital stock by William McDonough, C. C. Varnell and R. E. Jett and will equip a plant at once.

The Parma Veneer Products Company, Parma, Mo., with \$28,000 capital stock, has been organized to equip a veneer cutting plant. The incorporators are W. G. Coyner, E. L. Walker and R. L. Wilcox.

The Weldon Stave Company, Newport, Ark., whose incorporation was recently noted, will equip a plant with a capacity of 40,000 slack staves daily.

The town of Nashville, Ark., is preparing to install a waterworks system and is in the market for equipment. The work is in charge of R. G. Parker of that town.

The Central South

LOUISVILLE, KY., August 20, 1912.

The machinery trade in the Central South is still very quiet, but there is an excellent indication of its rising to an up grade before long, for the reason that the business is there and only favorable conditions are required to bring it out. August, enforcing the absence of many logical buyers upon vacations and providing in addition phenomenally cool weather this year, is not proving to be productive of many orders in any line. Forecasts vary as to the time when trade may be expected to improve genuinely. It is probable that brisk business in ice machinery will not open until the first of October. Power and industrial equipment of all sorts may be expected to improve just as the vacation time ends in early September. A modicum of business from railway car manufacturers is resulting from the pressure exerted upon this line of industry by the railroads, with shippers in various sections complaining of a car shortage.

A \$50,000 set of coal mining equipment is to be installed in the Tye Fork district of Knox county, Ky., by the Dean-Jellico Coal Company, Barbourville, Ky. Equipment is being provided for a production of 1000 tons of coal per day. Electric power will be used throughout.

The Williamstown Electric Light Company, Williamstown, Ky., which recently acquired a franchise to do business in that city, will purchase a 55-hp. oil engine, a 40-kw. dynamo and other equipment through J. E. Shoop, of 227 Fourth street, Danville, Ky., its president.

The Sisters of the Poor of St. Francis, in Covington, Ky., have awarded a contract to the Roche-Brunner Building Company, Cincinnati, for the erection of a hospital in Covington which is to cost \$500,000. A hot water heating plant, electric light and power equipment and fire prevention apparatus are to be installed. Plans for the work are in the hands of Samuel Hannaford & Sons, Cincinnati.

The Beattyville Stone Company, Beattyville, Ky., has been incorporated with a capital stock of \$10,000 and will operate a quarry with a capacity of 300 cu. yd. of stone and 500 cu. yd. of sand per day. A 50-hp. engine and suitable quarrying machinery will be utilized.

The South Fork Oil & Gas Company, Monticello, Ky., has been incorporated with a capital stock of \$200,000 to develop oil and gas wells in that territory. E. T. Caffrey, of Somerset, Ky., is an officer.

The Magnet Coal Company, Pineville, Ky., has announced that it will proceed with the development of 175 acres of coal property. J. N. Sharpe is president of the newly organized company, which will operate at Fourmile, Ky.

R. St. John is manager of the new Diamond-Jellico Coal Company, Barbourville, Ky., which has been organized by capitalists of Toledo, O. It will enlarge the capacity of the mining plant it has taken over in the Rossland district of Knox county, Ky.

The Carrsville Mining, Water & Light Company, Carrsville, Ky., will purchase mining equipment and will develop zinc deposits which have been located along the Kentucky shore of the Ohio River in Livingston county.

With a view of providing 24-hr. current for Stanford, Ky., George L. Penny, general manager of the Stanford Water, Light & Ice Company, is soliciting bids for additional equipment.

A plant to mine phosphates upon the farm of William Steele, near Midway, Ky., is to be erected at once by the Kentucky Phosphate Company, Midway. The present plant of the company is producing 30 tons of phosphate a day.

The Chastteen Signal System Company, Chattanooga, Tenn., is to be incorporated shortly for the purpose of manufacturing railway signal devices. A plant will be erected in Chattanooga, it is reported. W. J. Chastteen is president of the concern, W. P. Charlton is vice-president and Charles R. Evans is treasurer.

The Crystal Springs Bleachery Company, Chattanooga, Tenn., is planning the erection and equipment of

a cotton mill in connection with its bleachery at Crystal Springs, Ga. The mill will contain 2000 spindles and 800 looms.

The Byrd Matthews Lumber Company, Gainesville, Ga., has been incorporated with a capital stock of \$1,000,000 to develop timberlands.

The Seaton Wheel Company, Nashville, Tenn., manufacturer of a patented automobile wheel, has made arrangements to use the plant of the Southern Stamping & Metal Company of that city for the present and consequently will not require the machinery for which it was in the market. John T. Landis is president of the company.

The Board of Education of Chattanooga, Tenn., will install steam heating plants in three school buildings. R. H. Hunt is the architect in charge of the work and T. J. A. Hargraves is chairman of the committee which will receive proposals.

The Howard Machine Shops, Blackville, S. C., will purchase an engine lathe, 14 to 16-in. swing, and a light cold sawing machine to cut about 5 in.

L. F. Hobbs, Norfolk, Va., is in the market for a locomotive crane, with a capacity of 15 tons. It is to have a 50-ft. boom. A 10-ton, 40-ft. boom crane may also be purchased.

The Virginia Can Company, Buchanan, Va., will erect a plant for the manufacture of tin cans. The company will invest \$100,000 in its building and equipment. O. C. Huffman is president of the company.

Texas

AUSTIN, TEXAS, August 17, 1912.

For the first time in several months a slight dullness is to be noted in the machinery trade, but the demand for irrigation pumping plants and various other lines of larger machinery continues unusually good. Cotton crop prospects are not as favorable as they were at the beginning of the present month and this is having some effect upon the trade generally. The movement for the creation of drainage districts in the Gulf coast territory continues unabated. Already a number of large drainage districts have been formed and several dredges are at work. The new districts that have been created and are to be created will require a large number of additional dredges.

The Commissioners Court of San Saba county has ordered an election to be held September 14 to vote on the proposition of organizing an irrigation district embracing 35,634 acres of land and to issue bonds in the sum of \$449,000 for the purpose of constructing a system of irrigation to water the tract.

J. A. Kemp Oil Company, Wichita Falls, has been organized for the purpose of operating in the oil fields of Wichita county. The incorporators are J. A. Kemp, Wiley Blair, Frank Kell, all of Wichita Falls, and others.

The Southern Construction & Mill Supply Company, Houston, has been organized. B. M. Estes is largely interested.

The Alpine Power Company has been organized and will install additional machinery in its electric light and power plant at Alpine. It will also increase the capacity of its ice factory.

The St. Louis, Brownsville & Mexico Railway will install a large precooling and cold storage plant and an ice factory at Harlingen. It will also enlarge its terminal facilities. The total proposed expenditure will be \$185,000.

The Artesian Farms Company will install a system of irrigation upon a tract of land that it owns near Pearsall.

The Commissioners Court of Tarrant county is having plans prepared for the new bridge that is to be erected in North Fort Worth at a cost of \$350,000.

The Vim Oil Company, Saratoga, has been organized for the purpose of operating in the Texas oil fields. Charles A. Daly is interested.

The Groos Construction Company, Waco, has been organized with a capital stock of \$10,000. The incorporators are F. A. Groos, William F. Groos and J. H. Nicholson.

The Farmers & Merchants' Gin Company is remodeling its cotton gin at Sadler and installing new machinery.

It is announced at the headquarters of the Atlantic system of the Southern Pacific in Houston that the capacity of the general shops at that place will be doubled. Plans for the proposed improvement are now being prepared.

The Farmers' Gin Company is installing a large and modern cotton gin at Malone.

The Cypress-Blade Oil Company, which has secured

leases on about 3000 acres of land near Winnsboro, is preparing to begin the work of drilling wells on the tract. A. M. White of Dallas is president.

The shops of the Atchison, Topeka & Santa Fé Railroad at Cleburne, Texas, were damaged by fire August 12 with a loss estimated at \$250,000.

Frank N. Watts of Douglass, Ariz., and associates are arranging to construct a dam across the canyon at the mouth of Turkey creek and Ash creek, near Courtland, Ariz., for the purpose of impounding water to irrigate about 2000 acres of land.

The Arizona Copper Company is making rapid progress in the erection of its new smelter two miles south of Clifton, Ariz. The plant will cost about \$2,000,000. The smelter's stack will be of brick construction and 300 ft. high. Its diameter will be 20 ft. The construction of this stack is now in progress.

The Deming Real Estate & Improvement Company of Deming, N. M., has developed a large supply of water in a well and the same will be used to supplement the supply of the city waterworks. A 50-hp. motor and a turbine pump will be installed at the well.

Birmingham

BIRMINGHAM, ALA., August 19, 1912.

The demand for machinery continues steady. There are many inquiries, and sales are satisfactory. The sawmills are prominent in the market for supplies of all kinds. There is also a considerable demand from the cotton gin trade, which might be considered fair for this season. Mill supplies are holding up in good form and repair work is much in demand with a lot of it doing at all shops in that line. All business holds out a good future prospect and for that reason all machinery and supply dealers in this section express general satisfaction.

H. Collins has commenced the manufacture of sand bricks at Apalachicola, Fla., and contemplates extending operations.

Waycross, Ga., will vote in the near future on an issue of \$4,000 bonds for a crematory.

The Waukesha Mills, Cedartown, Ga., has been incorporated with \$25,000 capital stock by L. O. Benton and Eugene Benton and others, of Monticello, Ga., to manufacture cotton and woolen products.

F. A. Smith and Sam P. Aiken are interested in a company being formed with a capital stock of \$10,000 at McRae, Ga., for establishing a fertilizer plant.

The Ocala Gas Company, Ocala, Fla., has been organized with a capital stock of \$50,000. R. S. Hall is president and Emmett E. Robinson secretary and treasurer.

The Cooper Mfg. Company, Cooper, Ala., has been organized by J. H. Roberts and others to establish ginneries, grist mills, etc.

J. A. Morgan will establish a ginnership at Rockmart, Ga.

The Norman Park Gin Company, Norman Park, Ga., has been chartered by R. L. Norman, J. L. Downs and others to operate cotton gins.

The Consumers' Ice Company, New Smyrna, Fla., will install a 15-ton ice plant.

Kirby Hall will install an electric light plant at Collinsville, Ala., in place of one burned.

The National Cellulose Company proposes to select a site and erect a plant previously noted at Savannah, Ga. Burdett Loomis, Hartford, Conn., is in charge.

John R. Bell, of Gordo, Ala., has bought a timber right of 1100 acres and will establish sawmill, etc., near Eutaw, Ala.

The Punta Gorda Land & Lumber Company, Punta Gorda, Fla., which has been organized with a capital stock of \$1,000,000, will establish extensive woodworking plants.

The Board of Commissioners of Crisp County, Ga., will enlarge its steam-heating plant at Cordele, Ga.

The Pacific Coast

SAN FRANCISCO, CAL., August 13, 1912.

Orders are being placed by many small automobile and repair shops through the country, consisting usually of two or three tools, but few orders are coming from the larger shops. Several reports are circulated, however, of larger business in prospect. Preliminary figures are being taken on some good-sized installations, and it is expected that the inquiries will take definite shape before long. Considerable anti-

quoted equipment is used in local shops, which the owners wish to replace as soon as the situation warrants.

The Standard Oil Company is figuring on the installation of a general machine shop in the Bakersfield district, but it is not yet certain that the plan will be carried out.

Figures will probably be called for this month on the erection of a concrete power house for the Union Iron Works, to cost about \$100,000. This firm has been gradually making improvements, and while plans for the future are not definitely announced, it is believed that important preparations will be made for the opening of the Panama Canal. The shop superintendent, Frank Neitzel, is now visiting manufacturing centers in Europe.

The Giant Valve Company has been taking preliminary figures on a lot of equipment, and seems to be about ready to go ahead with its plant.

John Scott, of the Moore & Scott Iron Works, this city, has gone East to order marine engines, special steel work, etc., for the Western Pacific ferry boat for which this company has the contract.

Stone & Webster have purchased several tools of Harron, Rickard & McCone, this city, for use in the Pacific Light & Power Company's development. This company has also ordered seven 6-yard Koppel double-side dump cars, standard gauge.

The California Saw Works, which formerly had the Disston agency, but is now making its own saws, has placed an order for a Cincinnati miller.

Plans are being prepared for a municipal machine shop for Los Angeles, to handle automobile and fire department repairs.

J. L. Crowell, of the Los Angeles Dry Dock Company, a concern to be incorporated shortly, has announced plans for a large shipyard at Los Angeles Harbor.

According to recent reports from Los Angeles, the California Industrial Company, which has operated a small rolling mill in that city, has secured new financial support with the object of installing a large steel plant at the neighboring town of Wilmington. The project is said to be based on the use of oil fuel in reducing iron ore, and the development of ore deposits in southern California and northern Mexico. A large site has been secured at Wilmington, and the plans are said to include the construction of two 600-ton blast furnaces, open-hearth furnaces, blooming mills, etc. S. I. Merrill, general manager of the company, is on his way home from the East. Little is known of the project in San Francisco.

W. W. Norwak, formerly with Harron, Rickard & McCone, this city, and now representing the Niles-Bement-Pond Company in South America, has been transferred from Rio Janeiro to Buenos Aires, and expects to visit Chile shortly. He writes that prospects for machine tool business in South America are very favorable.

Woodworking machinery remains quiet, but several new lumber plants are being started in the interior, and will probably be out for more equipment before long.

The Tulare Lake Canal Company is working on a large reclamation project in which, aside from the canal construction, several large pumping plants will be required.

The Pacific Electric Railway Company, Los Angeles, has authorized the purchase of 95 electric cars, 10 1200-hp. motors, and a large electric construction crane.

Plans have been prepared for a municipal pumping plant for the town of Oxnard, Cal.

The Producers Transportation Company is preparing to lay a new 60-mile oil pipe line to reach the coast at San Luis Obispo, Cal., and its numerous boiler plants, pumping and heating stations will be greatly enlarged.

Glenn Black, this city, is preparing to start a small machine shop at Lodi, Cal.

San Benito County, Cal., will receive bids September 5 for a portable rock-crushing outfit, including elevator and screens.

The Western Sanitary Mfg. Company is starting work on a plant at Richmond, Cal., for the manufacture of enameled cast-iron sanitary fixtures.

The Los Angeles Paper Mfg. Company is building an addition to its factory.

Fields & Lowrie are figuring on the installation of a grain milling plant at Planada, Cal.

The San Francisco Brass Foundry, a partnership, has been formed by Nicholas Kremer and F. J. Carroll.

Eastern Canada

TORONTO, ONT., August 19, 1912.

The conditions of business with which all observers are familiar continue and are more marked. What has now come to be regarded as normal activity was a few years ago exceptional and extraordinary activity. Everything is now in favor of the maker and seller of equipment and machinery, everything but labor supply. Buyers have to wait and have to give the manufacturer his profits. He can no longer be bargained out of these. In eastern Canada the farm implement manufacturers have had an exceptionally busy year, and are assured of another as a consequence of the great crop in the West. The Massey-Harris Company, the International Harvester Company, the Cockshutt Plow Company, the J. I. Case Threshing Machine Company and the various other manufacturers engaged in this business are having more orders to attend to than they ever had before.

Direct rail and highway communication by a new bridge to the South Shore, the establishment of extensive railroad terminal facilities on McKay pier, the creation of an anchorage ground for vessels between the Old Guard pier and the Alexandra pier, and the construction of five new piers for ocean liners between Victoria and Laurier piers and better ferry connections form part of an immense campaign of improvements which the Montreal Harbor Commission proposes to carry out within the next three years, at an approximate cost of \$6,000,000.

The Mooney Company, Montreal, proposes to enlarge its plant in Stratford, Ont.

Fire caused a loss of \$100,000, when the box factory of Myers Thomas Company, of Granby, Que., was burned August 11. The insurance amounted to \$54,000.

The Rolland Paper Company, Montreal, proposes to enlarge its plant at St. Adele, and for that and other purposes a \$500,000 bond issue is being offered.

The town of Cartierville, Que., is to construct a main sewer to cost \$700,000.

The Canada Foundry Company, Toronto, has been awarded the contract for the pumps for the new municipal pumping station at Hamilton, Ont., and the Canadian General Electric Company, Peterborough, Ont., is to put in the motors and switchboards.

The Roelofson Elevator Works, Galt, is putting up a large factory in Galt, Ont.

The Tuckett Tobacco Company, Hamilton, is doubling its manufacturing capacity there.

The Long Lumber Company will establish lumber yard and box factory in Hamilton, spending about \$150,000 on buildings and machinery.

C. W. Sherman, Dominion Steel Castings Company, Hamilton, is connected with a syndicate that is negotiating for a 10-acre factory site in that city.

The Canada Cement Company, Montreal, is to increase the capacity of its plant at Pointe aux Trembles, Que., from 9000 to 12,000 bbl. per day.

The McClary Mfg. Company, London, Ont., is preparing to erect a large warehouse and office building in St. John, N. B.

The Dorchester Electric Company, Quebec, is putting in a turbine and generator plant to cost \$35,000.

The Tourville Lumber Company's mill at Louisville, Que., was recently destroyed by fire. Loss, \$18,000. The company will rebuild and install new plant.

The Canadian Tool Steel Company, Ltd., Toronto, has been incorporated with a capital stock of \$600,000 to manufacture cast steel and other metals and tools. Frank H. Phippen, Gerard G. Ruel and Reginald H. M. Temple are the provisional directors.

The Hacket Motor Company, Ltd., Oshawa, Ont., has been incorporated with \$350,000 capital stock and will equip a plant for the manufacture of motors, gasoline engines, etc. John Gray, Frederick H. Storey and Trevor G. Merton are the provisional directors.

The Computing Scales Mfg. Company of Canada, Toronto, is having plans prepared for a factory building which it will erect at Royce and Campbell avenues, West Toronto.

The Wood Chemical Company, Belleville, Ont., has secured a site and is completing arrangements for the erection of a manufacturing plant which will cost approximately \$150,000.

Plans are being completed for a foundry and machine shop estimated to cost \$100,000 to be erected at Sarnia, Ont., for the Canadian branch of the Mueller Mfg. Company of Decatur, Ill.

The Central Garage & Supply Company, Ltd., Toronto, has been incorporated with a capital stock of \$150,000 to manufacture automobiles, engines, etc., and will equip a plant for the purpose. Robert B. Haley, Ernest S. Benyon and Roydon J. Haley are the provisional directors.

Western Canada

WINNIPEG, MAN., August 15, 1912.

The local machinery houses report an improvement in the demand for general supplies. There is especially a large volume of business in castings and other machinery parts, as well as a steady inquiry for new plants. Electrically driven machinery is moving well, the demand for that line being continually increasing in western Canada according as power plants develop in the leading centers. Prospects for fall trade are better than ever, being stimulated by the assurance of a large grain crop in Manitoba, Saskatchewan and Alberta.

The Dominion Government has announced its intention of completing the Hudson's Bay Railway without any further delay. Additional contracts will be let in September, and it has practically been decided that Fort Nelson will be the terminus. It is predicted that important lumbering and mining industries will develop along the route in northern Manitoba and northern Saskatchewan.

The Hanbury Mfg. Company, Brandon, Man., is contemplating increasing its facilities for manufacturing office furniture and other fixtures.

The six-story warehouse which Revillion Wholesale, Ltd., is beginning to construct in Edmonton, Alta., will have three freight elevators. The firm was recently reincorporated under the laws of Alberta, with a capital stock of \$1,000,000.

The ratepayers of Saskatoon, Sask., have passed the by-laws submitted to give concessions to the Quaker Oats Company, which will erect a new oatmeal plant there and operate the flour plant of the Saskatoon Milling Company, Ltd.

Hiram Sykes, manager of the Cement, Stone & Brick Company, Calgary, Alta., will extend the industry to Edmonton where a branch factory will be established.

The Keystone Cement Company, which is preparing to operate a manufacturing plant at Blairmore, Alta., has been incorporated with a capital stock of \$700,000 of common stock, and \$500,000 of 6 per cent. first mortgage bonds.

The Grain Growers' Grain Company, Ltd., Winnipeg, which recently took over the Manitoba Government grain elevator system, will erect an elevator at Ashville, Man.

The Northwest Drilling Company, Ltd., Calgary, Alta., will shortly begin boring for gas at Castor, Alta. Gas has already been struck there at two places.

Blackwoods, Ltd., Winnipeg, has plans prepared for a large new plant for manufacturing pickles and aerated and distilled waters. It will cost about \$200,000.

Among the improvements to be made in its Winnipeg shops by the Canadian Northern Railway will be a planing mill to cost about \$16,000.

The Board of Control of Winnipeg is considering a proposition to extend the city's power plant at Point du Bois, Man. An official announcement will likely be made in a few days.

MacKenzie & Mann and associates, a branch of the Canadian Northern Railway, are contemplating the development of hydroelectric power at the Bonnet Falls, north of Fort Alexander, Man., for the purpose of operating an electric road from Winnipeg along the eastern shores of Lake Winnipeg.

The Armstrong Mfg. Company, Waterloo, Iowa, manufacturer of well-drilling machinery and gasoline engines, is reported preparing to establish a factory in Saskatoon, Sask.

A by-law has been indorsed by the ratepayers of Gleichen, Alta., to spend \$5,000 on a waterworks plant.

The town of Grandview, Man., is contemplating additions to its waterworks system, at a cost of \$13,000.

A factory is being planned for the Dominion Fire Proofing Company, Ltd., Medicine Hat, Alta., incorporated with a capital stock of \$300,000. One of the principals of the company is Warren Overpack, Medicine Hat.

Government Purchases

WASHINGTON, D. C., August 19, 1912.

The United States Marine Corps, Quartermaster's Department, Washington, will open bids September 10 for the construction at the marine barracks, Norfolk, Va., of one sump pit and pump house, including machinery.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids August 24 for two hand-fired 250-hp. horizontal longitudinal drum water tube boilers for 200 lb. pressure, to be installed at Newport, R. I. The appropriation available is \$15,000.

The United States Engineer Office, Portland, Ore., will open bids September 13 for furnishing boilers for two dredges.

The Commissioners of the District of Columbia, Washington, will open bids August 28 for furnishing and delivering one asphalt paving plant.

The Paymaster-General, Navy Department, Washington, will open bids September 10 for furnishing the following supplies: Schedule 4762, class 131, 29 single-phase, 60-cycle, oil-cooled transformers; schedule 4773, class 21, one continuous blueprinting machine, one No. 3 Toledo pipe threading tool; schedule 4774, class 31, one type 3 Quick work rotary shear complete.

Trade Publications

Electric Grab Bucket Cranes.—Sprague Electric Works of the General Electric Company, 527 West Thirty-fourth street, New York City. Bulletin No. 902. Illustrates and describes the Sprague electric grab bucket cranes, the method of control and their operation. These cranes are built in the monorail, gantry or bridge type, all of which are illustrated together with a number of views of installations.

Guy Anchors and Clamps.—W. N. Matthews & Bro., St. Louis, Mo. Two folders. Call attention to the Matthews guy anchor and boltless guy clamp, the latter of which was illustrated in *The Iron Age*, October 5, 1911.

Pump Valves.—Hill Pump Valve Company, 18 East Kinzie street, Chicago, Ill. Pamphlet entitled Pump Slippage, Its Cause and Prevention. Contains a discussion of the subject of the causes and extent of pump slippage, the matter being supplemented by extracts from reports from the water departments of several large cities and from articles which have appeared from time to time in the technical papers. This is supplemented by a table giving the results of tests made upon waterworks pumps in regular service in a number of cities, together with others giving the cost of pumping water in various localities and with different types of engines and the cost of slippage in pumping engines. A brief illustrated description of the company's pump valve which is claimed to be non-slipping completes the pamphlet.

Brass and Iron Goods and Specialties.—Kelly & Jones Company, Greensburg, Pa. Catalogue L. Size, 5½ x 7½ in.; pages, 466. Lists an extensive line of brass and iron goods and specialties for steam, gas, water and oil. Where necessary the engravings are supplemented by brief text descriptions of the various articles and tables giving the sizes in which they are made together with prices are included. A number of tables of useful information on various subjects, a special telegraph code and an especially complete index which is arranged both alphabetically and numerically by figure numbers are included.

Coupler Yoke Shearing and Riveting Press.—Watson-Stillman Company, 190 Fulton street, New York City. Catalogue No. 87. Describes and illustrates a new hydraulic coupler yoke shearing and riveting press. This machine shears riveted coupler yokes from their couplers or clamps and rivets the couplers and yokes together with a single stroke of the ram.

Track Scale.—Standard Scale & Supply Company, Pittsburgh, Pa. Folder. Calls attention to a new type of railroad scale with suspended platform and bridge ends which this company has recently brought out. It is characterized by greater capacity, durability and accuracy than has been previously possible. This scale which has a capacity of 150 tons was illustrated in *The Iron Age*, August 15, 1912.

Taps and Dies.—Winter Bros. Company, Wrentham, Mass. Catalogue No. 7. Devoted to the Thistle brand of high speed steel taps and dies. After a discussion of the factors governing the size of taps, the lead, speed of operation, lubrication and the shape of the cutting edges together with a brief description of the standard threads now in use, the various types of taps and dies made are illustrated and briefly described with a list of prices.

Electric Drive.—General Electric Company, Schenectady, N. Y. Bulletins Nos. 4932 and 4976. Devoted to electric drives in the brewing industry and in grain elevators and in flour mills respectively. The latter bulletin supersedes No. 4742.

Engine Indicator and Efficiency Reckoner.—Herman Bacharach, 722 Lewis Block, Pittsburgh, Pa. Catalogue. Devoted to the patent Maihak indicator equipped with Böttcher's efficiency reckoner which is a device for giving the mean indicated efficiency of steam and gas engines, pumps and compressors directly by simply

reading off a counting instrument and multiplying by an apparatus constant. An illustrated description of this indicator and reckoner appeared in *The Iron Age*, August 15, 1912.

The Illuminating Engineers' Convention

The programme has been issued for the sixth annual convention of the Illuminating Engineering Society to be held at Hotel Clifton, Niagara Falls, Ont., Canada, September 16 to 19. It is as follows:

1. Report of Committee on Progress. This report will deal with the recent progress and developments in the lighting industry both in this country and abroad.
 2. A report of the Committee on Nomenclature and Standards which will deal with certain definitions and terminology of illuminating engineering.
 3. "Steel Mill Lighting," a report of the Committee on Illumination of the Association of Iron and Steel Electrical Engineers, to be presented by the chairman, C. J. Mundo.
 4. "High Pressure Gas Lighting," by F. W. Goodenough, chairman of Council, Illuminating Engineering Society, London, Eng.
 5. "The Status of High Pressure Gas Lighting," by George S. Barrows. This paper will be a collation of domestic and foreign correspondence pertaining to high pressure gas lighting.
 6. "Recent Developments in Gas Lighting," by R. F. Pierce.
 7. "Indirect and Semi-Indirect Illumination," by T. W. Rolph.
 8. "Recent Developments in Series Street Lighting," by Dr. C. P. Steinmetz.
 9. "Research Methods," by Dr. E. P. Hyde.
 10. "The Problem of Heterochromatic Photometry and a Rational Standard of Light," by Dr. H. E. Ives.
 11. "Reflection from Colored Surfaces," by Claude W. Jordan.
 12. "Diffuse Reflection," by Dr. P. G. Nutting.
 13. "A Study of Natural and Artificial Light Distribution in Interiors," by M. Luckiesh.
 14. "The Physiology of Vision," by Dr. T. A. Woodruff.
 15. "The Efficiency of the Eye Under Different Systems of Illumination," by Dr. C. E. Ferree. This paper will be a report of a research carried on for the American Medical Association.
 16. "A Proposed Method of Determining the Diffusion of Translucent Media," by E. L. Elliott.
 17. "Illumination Charts," by F. A. Beuford.
 18. "The Determination of Illumination Efficiency," by E. L. Elliott.
 19. "An Absolute Reflectometer," by Dr. P. G. Nutting.
 20. "Colored Values of Illuminated Surfaces," by Bassett Jones, Jr. This subject will be presented in the form of a series of experimental demonstrations.
 21. One session will be arranged for a potpourri, at which discussions will be in order on miscellaneous phases of illuminating engineering. It is expected that this session will bring out interesting and valuable points not particularly covered by the above papers and reports.
- Norman Macbeth, 29 West Thirty-ninth street, New York, is chairman of the Committee on Arrangements.

Attention to the extensive use of molding machines in the automobile industries is called in the August number of the Merry Molder, published by the Osborn Mfg. Company, Cleveland, Ohio. The publication contains numerous illustrations taken in the foundry of the R. C. H. Corporation, which is said to be one of the most complete in the country and in which it is stated that all the gray iron castings are made with the aid of the Osborn molding machines. The illustrations show the use of the Osborn drop plate flask strippers in making difficult models for four-cylinder *en bloc* engine castings and in making crank-case molds, pistons, etc.

The American Society of Engineer Draftsmen held its monthly meeting in the Engineering Societies Building, New York, on the evening of August 15. A paper was read by W. T. Walters, a Chicago member, on "Safety Devices: Their Application and Design," which was followed by graphic instances of the need of safety devices of which members had personal knowledge. Prof. Charles William Weick, of Columbia University, gave an interesting lecture on "Practical Perspective."

Foucar, Ray & Simon, Inc., have moved their office and warehouse to their new permanent location, 512-514-516 Folsom street, San Francisco, Cal. They recently acquired the property and have erected a warehouse building particularly adapted to their requirements, possessing all modern equipment for convenient and rapid handling. They will continue to carry a complete general jobbing stock of iron and steel in all the various lines.

